Roy Underhill's 'Impossible' Dovetails Exposed

POPULAR Woodworking MAGAZINE

NOVEMBER 2011 ■ #193

Southern Lady's Desk

High Style & Hidden Joinery

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9 New Tools from Scrap Plane Parts

Build a Bowsaw: X-ray Reveals the Old Way is Best

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CONTENTS

NOVEMBER 2011

34

38

40

FEATURES

24 Southern Lady's Desk

This graceful secretary with an appealing gallery is a reproduction of a late 18th-century piece from the collection of the Museum of Early Southern Decorative Arts.

BY GLEN D. HUEY

ONLINE ▸ Router-enhanced Dovetails

Watch as Glen uses a router freehand to waste out his dovetail sockets – then give it a try yourself (it's not as scary as it sounds).

popularwoodworking.com/nov11

34 New Uses for Old Handplanes

Frogs, irons and handles can all be used to construct clever shop-made tools.

BY JEFF MILLER

ONLINE ▸ New Life for a Vintage Table Saw

Editor Steve Shanesy refurbishes a 1940s Delta Unisaw in our series of free videos.

popularwoodworking.com/nov11

38 The 'Impossitails Zone'

Amaze your friends and family with these seemingly impossible joints: the quadratail and the rising dovetail.

BY ROY UNDERHILL

ONLINE ▸ 'The Woodwright's Shop'

Select episodes from Roy's venerable PBS show are available for free online viewing.

popularwoodworking.com/nov11

40 Tommy Mac & 'Rough Cut'

As this newest woodworking television show begins its second season, discover the host's path to success.

BY GLEN D. HUEY

ONLINE ▸ Behind the Scenes

Take a video look behind the scenes of "Rough Cut: Woodworking with Tommy Mac."

popularwoodworking.com/nov11

44 Make a Shapely Bowsaw

This curvaceous saw cuts quite a figure – and the tapered handle holes make it work better than commercial versions available today.

BY WILLARD ANDERSON

ONLINE ▸ Bowsaw Ergonomics

Windsor chairmaker Michael Dunbar shows you how to use a bowsaw in this free video.

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50 Wiping Varnish

This definitive guide to using one of the easiest woodworking finishes is excerpted from the book "Wood Finishing 101."

BY BOB FLEXNER

ONLINE ▸ Wiping Varnish – What is It?

Need a bullet-point guide to understanding and using wiping varnish? You'll find it here.

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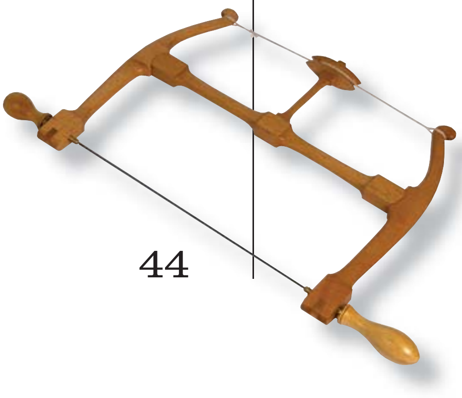
44

COVER PHOTO BY AL PARRISH; OLD HANDPLANES PHOTO BY JEFF MILLER; DOVETAILS PHOTO BY ROY UNDERHILL;
'ROUGH CUT' PHOTO BY GLEN D. HUEY; BOWSAW PHOTO BY WILLARD ANDERSON

CONTENTS

NOVEMBER 2011

REGULARS

8 What Goes Around Comes Around
ON THE LEVEL
BY STEVE SHANESY

10 Applied Drawer Fronts
LETTERS
FROM OUR READERS

14 Table Saw Infeed Table
TRICKS OF THE TRADE
FROM OUR READERS

VIDEO ▸ Tricks-in-Action

Watch videos of some of our tricks at work.
popularwoodworking.com/tricks

16 Bosch Random-Orbit Sander
TOOL TEST
BY THE EDITORS

ONLINE ▸ Tool Test Archives

We have many tool reviews on our web site, free.
popularwoodworking.com/tools

20 Keep Your Edges Sharp
ARTS & MYSTERIES
BY ADAM CHERUBINI

58 Tool Tote
I CAN DO THAT
BY MEGAN FITZPATRICK

62 Glossary
TERMS OF THE TRADE

Woodworking's terminology can be overwhelming. Learn the terms used in this issue.

64 The Apprentice
END GRAIN
BY ELIA BIZZARRI

POPULAR Woodworking MAGAZINE

Number 193, November 2011. *Popular Woodworking Magazine* (ISSN 0884-8823, USPS 752-250) is published 7 times a year, February, April, June, August, October, November and December, which may include an occasional special, combined or expanded issue that may count as two issues, by F+W Media, Inc. Editorial and advertising offices are located at 4700 E. Galbraith Road, Cincinnati, Ohio 45236. Unsolicited manuscripts, photographs and artwork should include ample postage on a self-addressed, stamped envelope (SASE); otherwise they will not be returned. Subscription rates: A year's subscription (7 issues) is $24.95; outside of the U.S. add $7/year ▪ Canada Publications Mail Agreement No. 40025316. Canadian return address: 2835 Kew Drive, Windsor, ON N8T 3B7 ▪ Copyright 2011 by *Popular Woodworking Magazine*. Periodicals postage paid at Cincinnati, Ohio, and additional mailing offices. Postmaster: Send all address changes to *Popular Woodworking Magazine*, P.O. Box 420235, Palm Coast, FL 32142-0235 Canada GST Reg. # R122594716 ▪ Produced and printed in the U.S.A.

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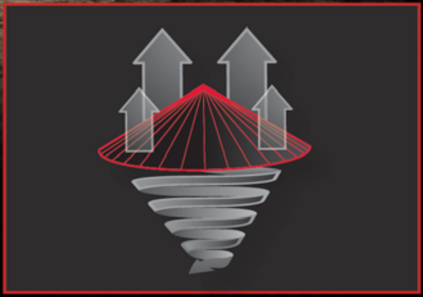

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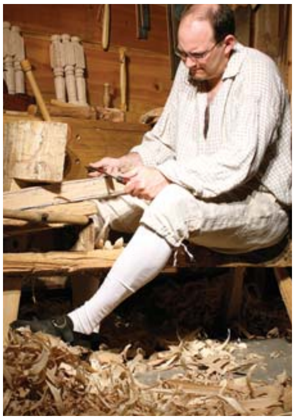
Willard Anderson
"Make a Shapely Bowsaw," page 44.

Bill Anderson lives on Edwards Mountain in Chatham County, N.C. Now that he's retired from his research scientist career with the Environmental Protection Agency, his daily commute is but a 100' walk down the hill to his shop.

Bill's furniture-making interests tend toward American period styles, with a particular focus on Queen Anne. His woodworking classes primarily focus on hand-tool skills, and he teaches out of his own shop, at The Woodwright's School (Pittsboro, N.C.) and at the John C. Campbell Folk School (Brasstown, N.C.). Bill is a member of the Society of American Period Furniture Makers, Mid-West Tool Collectors Association and Early American Industries Association.

▶ *To read more about Bill, his work and his woodworking classes, visit his web site at EdwardsMountainWoodworks.com.*



Adam Cherubini
"Keep Your Edges Sharp," page 20.

Adam Cherubini's day job took him away from us for a while, but he's back in the shaving horse saddle as our Arts & Mysteries columnist (a role he's held since 2005), and we couldn't be happier!

Adam builds 18th-century style furniture using 18th-century tools and techniques – and everything he builds is done completely by hand. And if Adam can't find the period tool he needs, he'll make that, too.

In addition to serving as a columnist for and contributing editor to *Popular Woodworking Magazine*, Adam is a professional cabinetmaker who has been twice recognized by *Early American Life Magazine* as one of the best traditional artisans in the country.

▶ *To read more from Adam and to reacquaint yourself with his woodworking philosophies, visit his Arts & Mysteries blog – it's under the "Blogs" link at popularwoodworking.com.*

Elia Bizzarri
"The Apprentice," page 64.

Elia Bizzarri is a professional Windsor chairmaker, who also makes tools for chairmaking and turned parts for chairs. Elia teaches his craft in his Chatham County, N.C., workshop, at the John C. Campbell Folk School and at The Woodwright's School. His work has been featured in The North Carolina Museum of Art, and he's been featured on two episodes of "The Woodwright's Shop" on PBS.

Elia served his chairmaking apprenticeship with Curtis Buchanan in Jonesborough, Tenn., and he's also worked with John Alexander, Drew Langsner, Dave Sawyer and the carpenters at Colonial Williamsburg. You can read about his path to becoming a chairmaker in our End Grain column – Elia's first story for the magazine.

▶ *Read more about Elia and his work, and see examples of his tools and chairs, at handtoolwoodworking.com.*

POPULAR Woodworking MAGAZINE

NOVEMBER 2011, VOL. 31, NO. 6
popularwoodworking.com
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NEWSSTAND DISTRIBUTION:
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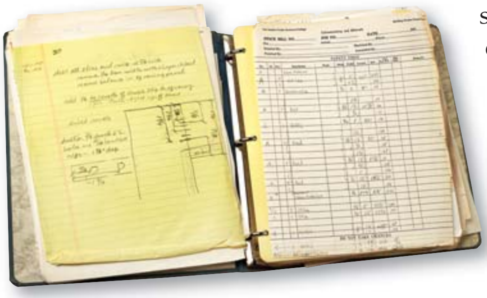
ON THE LEVEL

BY STEVE SHANESY, EDITOR

What Goes Around Comes Around

Six years and 41 issues ago I said my goodbye to you in this column. My role with the magazine had changed after serving as editor for 11 years and 69 issues. I was leaving the "stage" for a place in the back of the theater, a good location to keep an eye on both the performance and the box office. The editorial staff was well seasoned and had been doing most of the heavy lifting anyway. I was confident you were in capable hands.



As you know, Christopher Schwarz, who became editor in 2005, has moved on to pursue his own publishing dreams – though he remains a contributing editor and will continue to write for us regularly. So for a while anyway, I'm back in my old job and am glad to be stepping down from running the "business" side of *Popular Woodworking Magazine*.

This change for me has prompted more than a little reflection on my 30-plus years of full-time engagement with woodworking. I spent the first half of those years learning the craft and eking out a modest living in woodworking shops. My education in woodworking included on-the-job training and two years of night classes at Los Angeles Trade Technical College (that's my treasured school notebook in the photo). I owe much of my career path to my teacher and mentor, Charles Porter. I also had a significant shop experience at AE Furniture Manufacturing (which is regrettably now gone) in Los Angeles, learning from remarkable craftsmen who produced amazing work.

I've also reflected on my years with this magazine. When I first joined the staff, we were struggling to find an editorial mission and audience. In the late 1990s, we made sometimes-risky but significant changes.

In the early years of the 21st century, we made the decision to get serious about hand tools. We later cooked up the concept of *Woodworking Magazine* – then made the difficult decision to close it and remake *Popular Woodworking Magazine* as a hybrid of the two. Four years ago, we launched our annual Woodworking in America conference.

And now I find myself back in the editor's chair. I'd like to say it feels comfortable, like a familiar and favorite sweater. But it is not entirely so. While much is familiar, there are many new parts of this job I need to learn – Google SketchUp and our page-design software, for example.

Enough reflection. We've a magazine to edit, blogs to write, videos to film … and I have some new software to learn.

It is good – if slightly overwhelming – to be back. **PWM**

Steve Shanesy

PHOTO BY AL PARRISH

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Safety is your responsibility. Manufacturers place safety devices on their equipment for a reason. In many photos you see in *Popular Woodworking Magazine*, these have been removed to provide clarity. In some cases we'll use an awkward body position so you can better see what's being demonstrated. Don't copy us. Think about each procedure you're going to perform beforehand.

Highly Recommended

A slightly modified paint scraper can be an inexpensive multi-purpose tool in your shop. I've used one for years for everything from scraping glue to leveling edge joints that aren't quite flush.

The only modification needed before putting it to work is sharpening the cutting edge. And to do that, it's just a quick pass or two on the grinder. If the blade comes straight, knock off the corners or camber the edge slightly. I use a scraper for rough work so I don't bother to further refine the edge. A sharp edge, the long handle and downward pressure makes an inexpensive scraper effective for numerous jobs.

— Steve Shanesy

PHOTO BY STEVE SHANESY

How Do You Create Endless Cabinet Door Making Possibilities?

Profile Shown:
Round Over
(#99-760)

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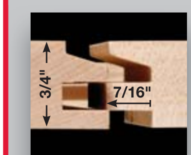

Industry Standard Stub Tenons Joints

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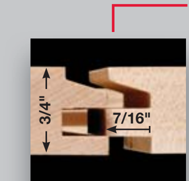
Freud's New Premier Rail & Stile System



Industry Standard Stub Tenons Joints

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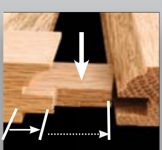

Extended Tenons For Extra Strength

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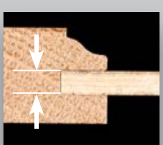

Adjustable Grooves For Variable Panel Thickness

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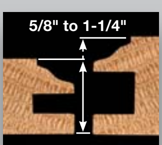

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Applied Drawer Fronts

Your coffee table in the August 2011 issue is lovely. But what caught my eye was your solution to the drawer-front problem.

I'm building a double-wide chest out of cherry, and I have some interesting boards for the drawer fronts. The problem is I don't have enough. Others have suggested cutting veneer from the best board, but I lack the equipment (and the knowledge) to apply veneer.

Would your solution work? Could I resaw a board to, say, 3/8" thick and apply it to a cherry substrate? How did you glue your fronts to the substrate? Do you foresee any problems down the road?

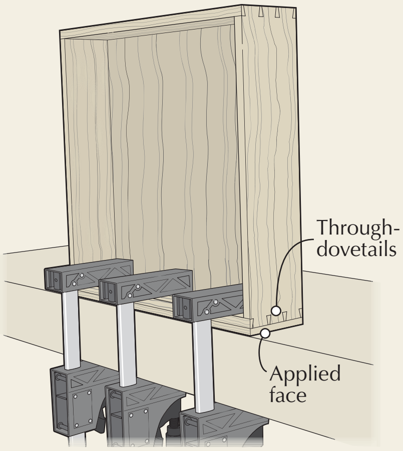
Richard Mertens
via e-mail

Richard,
Thanks. Yours is analogous to the challenge I faced; the same solution will work for you.

Resaw your boards – I'd recommend 1/4" thick, which may yield you an extra piece – then cut them to exact size (or just a hair over) and surface them so that the glue face is dead flat (you don't want any voids between the front and the substrate, especially at the edges).

Adjust the depth of your drawer box measurements by the thickness of the fronts, then build the boxes.

Now, place the front face down on your bench and apply glue across the back (a 3" roller works well to distribute the glue fully and evenly). Align the front of your drawer box with the back of the face, then use several clamps to squeeze the pieces together, using your benchtop as a clamping surface to help distribute the pressure evenly across the glue-up.



Or, you could apply the fronts to the substrate before you build the boxes, cut them to size after the glue sets, then build your boxes – but if you're using dovetails, it's easier to simply cut through-dovetails on the boxes first then apply the front – and if the species are the same, they'll look like half-blind dovetails when you're done.

I don't foresee problems – the glue is stronger than the wood fibers, so I'm confident the applied fronts will stay in place.

Megan Fitzpatrick, managing editor

Panel Glue-up Guidance

Having had very little experience gluing-up panels (I've done it twice), I would appreciate your guidance. I am now using a panel-clamping system.

My first panel was done with biscuits. It worked, but doesn't it fit with my view of things.

For my second panel, using my new clamps and 2" wooden bars/cauls, I used dowel pins at the recommendation of a friend (a "machine guy"). I drilled the holes on one side using a self-centering doweling jig then marked the mating edge with dowel/tenon centers pressed in place with my clamping system before drilling with the jig. I lightly sanded the dowel pins so they would press in with my clamping system and no pounding, then glued up the panel. This panel came out fine, but the process was kind of a pain.

I don't recall your having referred to using dowel pins when gluing-up panels, so I thought I'd ask: Do you think dowel pins (or biscuits) add any value in this process?

Wayne Fisher
via e-mail

Wayne,
The problem with all alignment systems (biscuits, dowels, splines) is that ultimate accuracy is required over the entire length of all your pieces of stock. And wood, as you know, is a material that has a mind of its own.

So attempting to force it to your will with some mechanical device is usually folly. And, neither biscuits or dowels add any strength to the joint.

The better way to go is to trust your hand and your eye. Glue up your panels without any alignment aid – shift the surfaces around until you have a perfect seam. You will find with a little practice that it is simple to get a large panel flush at its seams with only a little persuasion here and there – I like to use a scrap of wood that I hit with a hammer to coax boards into alignment.

Christopher Schwarz, contributing editor

Tabletop Tear-out Woes

I am well along on a pair of maple tables with 20" x 40" tops, using a design I modified from Kerry Pierce's book, "Pleasant Hill Shaker Furniture" (Popular Woodworking Books).

Unfortunately, I have some tear-out on the tops in a few spots, a consequence of running them through the planer. It's deep enough that I doubt a scraper will remove it. Can one fill in this roughness with, say, an epoxy coating (as is used on bar tops), or should I attempt to remove it (and if so, how?). Or should these tables be examples of painted Shaker

CONTINUED ON PAGE 12

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CONTINUED FROM PAGE 10

furniture – in which case I'm sure a skim coat of Bondo would heal all tear-out? I don't intend to stain them.

John Kahler
West Chester

John,
I actually think that filling the tear-out with Bondo or putty would be the last thing I would do. Because the maple will change color over time and the putty will not, the repair will look obvious and ugly in short order (unless, of course, you paint it). And you could putty and paint it, but that would be a waste of good maple.

My first preference would be to get some more maple and remake the tops.

Barring that, I'd learn to live with the tear-out. Early pieces, especially the less ornate ones, had tear-out – even on show surfaces.

Christopher Schwarz, contributing editor

Attach a New Worksurface To an Old Cast Iron Base

My wife and I recently bought our home from a retired machinist who left us a couple of sturdy workbenches with bases made from 10-gauge angle iron.

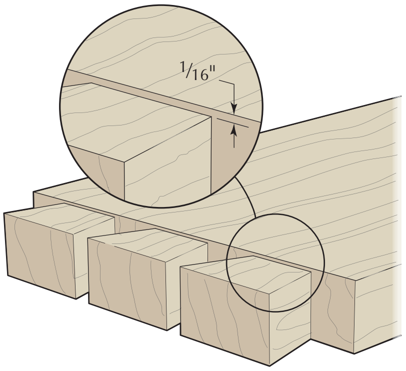
I've decided to make a workbench with a laminated wood top, and one of these bases would be excellent to use because it's heavy, easy to level and has a shelf below.

I am wondering what the best way would be to attach a steel frame to a wood top. Currently, the top is three 2x8s screwed to four 1¼" 12-gauge angle iron lengths that are attached to the iron frame by nuts and bolts, so disassembling it is rather straightforward.

Jeremy Brooks
Arlington Heights, Illinois

Jeremy,
The best approach is probably to attach from below with ¼"-diameter lag screws. You could also run nuts and bolts completely through, counterboring for the bolt heads in the top surface, but I don't think you need to do that. If you're concerned with the wood top shrinking or swelling, make the holes in the metal frame slightly oversized.

Robert W. Lang, executive editor



Why the Dovetail Rabbet?

I've begun hand cutting my dovetails in earnest and I'm now in the middle of a "30 days of dovetails" experiment, in which I've cut one or two joints every day. So far I have been seeing good results.

Christopher Schwarz has mentioned several times that he cuts a shallow rabbet on the tail board, which helps him line up the boards for marking the pins. My stacked dado set will only set to ½" and I use mainly ¾" and ⅞" stock. I could run my stock over the dado stack twice (but that leads to mistakes), or I could buy a new dado set. Before I do that, however, I was wondering if the rabbet makes the joint any better.

I'm trying to incorporate as much handwork as possible and don't want to use the dado stack at all – but if it makes the dovetails fit better it is worth a try in my book.

Bill Lattanzio
Spring City, Pennsylvania

Bill,
The function of the rabbet is to give you a firm location to register the two boards together when you mark one part of the joint from the other. Many woodworkers cut great dovetails without it. If you have another way to hold the boards in position while you mark you should be OK, especially if you're cutting pins first. One of the advantages of pins first is that you can exert downward pressure as you hold the board in place, and that makes it less likely to slip than it would if you were marking the pins from the tails.

If you want to try using the rabbet, you don't need the dado set to do it. The rabbet can (and should) have a minimal depth. The preferred hand-tool approach is to make it by taking a few swipes with a rabbet plane, but there is no reason why you shouldn't be able to make the shoulder cut with your marking gauge, and pare the rabbet with a chisel.

Robert W. Lang, executive editor

"One minute of patience,
10 years of peace."
— Greek Proverb

Handplanes for Youngsters

What bench plane does Christopher Schwarz's daughter Katy use? I have young daughters who are learning woodworking so I need a plane recommendation for smaller hands.

Christopher Kuehn
via e-mail

Christopher,
Katy likes a No 4. The weight of the tool helps her keep it in the cut (the downward pressure is a problem for young arms). **PWM**

Christopher Schwarz, contributing editor

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TRICKS OF THE TRADE

EDITED BY KARI HULTMAN

THE WINNER:

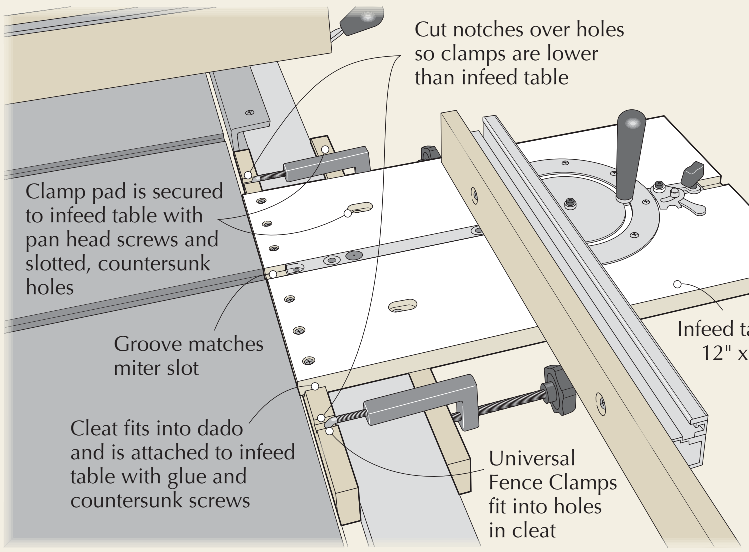
Table Saw Infeed Table

The limited crosscut capacity of my cabinet saw made it a challenge to cut wider boards, so I designed an infeed table that hangs on a wall when not in use and quickly and securely attaches to the front rail of my saw with Universal Fence Clamps (Rockler #31373).

To make the infeed table, use a piece of melamine or other stable material that measures approximately 12" wide x 24" long. Cut a lengthwise groove in the center of the board that matches the miter slots on your saw.

Cut two pieces of $\frac{3}{4}$" hardwood 2" wide x 18" long for the fixture's front cleat and clamp pad. Beneath the front edge of the infeed table, cut a $\frac{1}{8}$"-deep x $\frac{3}{4}$"-wide dado that fits the hardwood cleat snugly. The location of the dado is determined by the gap between the front edge of the table saw and its guide rail.

Use glue and countersunk screws to secure the cleat into the dado. The infeed table's surface needs to be flush with or slightly higher than the table saw's surface, so you need to glue a hardwood shim beneath the portion of the infeed table that rests on the saw's rip fence rail.


Cut notches over holes so clamps are lower than infeed table
Clamp pad is secured to infeed table with pan head screws and slotted, countersunk holes
Infeed table is 12" x 24"
Groove matches miter slot
Cleat fits into dado and is attached to infeed table with glue and countersunk screws
Universal Fence Clamps fit into holes in cleat

To attach the clamps, drill a hole about $1\frac{1}{2}$" from both ends of the fixture's cleat. The clamps need to be lower than the infeed table's surface, so cut a notch at both holes.

The clamp pad is secured to the infeed table with two pan head screws that slide in slotted, countersunk holes milled into the infeed table's surface.

Align the fixture with the table saw's miter slot and tighten the clamps. The miter gauge should slide easily between the infeed table and table saw. If the infeed table's cleat isn't perfectly square to the table saw and the slots are misaligned, you can shim either side of the infeed table's fence with painter's tape to adjust the angle.

The clamps and fence hold the table level with any board up to about 24" wide. With a wider piece, you can add an outboard stand for more support.

Reed Robinson
Dallas, Texas

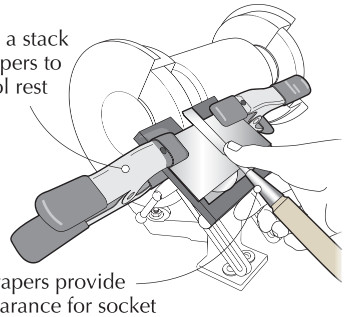
Grinding Socket Chisels

I recently added a larger tool rest to my grinder and discovered that the tapered portion of my socket chisels won't allow their blades to reach the grinding wheel without tipping the handles upward and changing the sharpening angle. Shorter chisels have the same problem.

I rectified the problem by clamping a stack of three cabinet scrapers to the tool rest; that provides the necessary clearance for the socket. You can use a thick piece of steel as an alternative.

The metal scrapers help control overheating because they conduct heat away from the tool, and the slippery metal surface helps my tools slide easily when sharpening.

Don Henderson
Orleans, Ontario, Canada


Clamp a stack of scrapers to the tool rest
Scrapers provide clearance for socket
(Note: Left hand removed for clarity)

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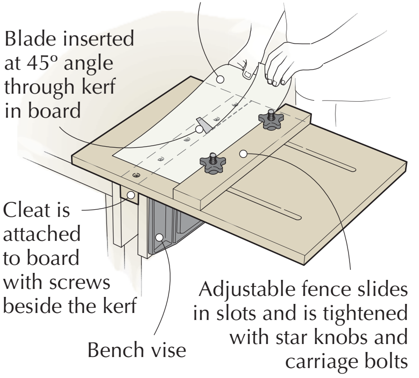

Pull sandpaper toward you through the blade
Blade inserted at 45° angle through kerf in board
Cleat is attached to board with screws beside the kerf
Bench vise
Adjustable fence slides in slots and is tightened with star knobs and carriage bolts

Sandpaper Ripping Jig

I designed this jig to cut 3"-wide strips of sandpaper for my drum sander, but it's adjustable to accommodate other widths.

Start with a piece of ¾" plywood that measures 12" wide x 16" long. Cut a 7"-long kerf that's about 4"-5" from the right side of the 12" edge. On the bottom of the board screw a ¾" x 1½" x 12" cleat along the right side of the 7" kerf.

Rout two slots that are perpendicular to the kerf, each one a few inches from the long edges of the board. Then, cut a piece of wood that's about ¾" x 2½" x 12" to make the fence. Drill two holes through the fence that align with each slot. Slide carriage bolts through the slots and fence, then secure the fence with star knobs. The fence's position determines the width of the cut sandpaper.

I marked lines on the board to help register the fence for different widths of sandpaper.

The cutter is made from a used reciprocating sawblade. Grind the teeth off and file or grind a bevel on the right side to create a sharp edge.

To use the jig, place the cleat in a vise. Slide the blade through the kerf and position it at a 45° angle, with the cutting edge facing away from you. The blade should protrude above the board about 3". Tighten the vise.

Because the blade is right beside the cleat, both are clamped tight.

Set the fence the appropriate distance from the blade. Turn the sandpaper upside down on the far side of the blade, lift the sandpaper slightly to start the cut. Then, pull the sandpaper toward you through the blade.

John Leonardi
Cleves, Ohio

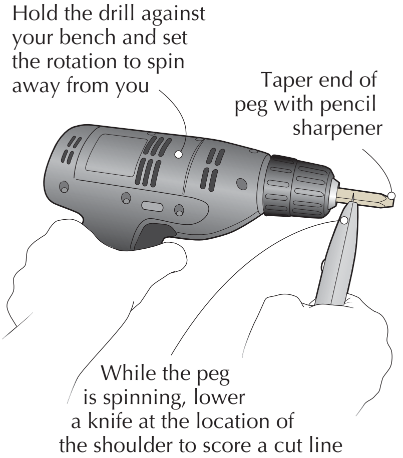
Square Pegs in Round Holes

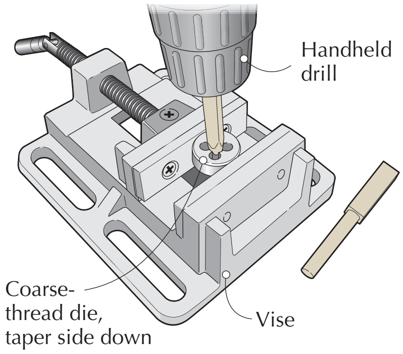
I like the look of square pegs for pinning mortise-and-tenon joints, but I don't like to make square holes for the pegs. So I came up with this solution using a 5⁄16" coarse-thread die to make pegs that are round on one end and square on the other.

Rip some hardwood into ¼"-square strips and cut it to length. Chuck the peg stock into a handheld drill. Insert the hardwood strip into a pencil sharpener, gently start the drill, and slowly taper the end (you can also whittle it). This makes it easier to start the peg in the die.

Mark a line for the shoulder with a pencil. Lay the drill on its side on your bench and set the direction of rotation so the peg stock is spinning away from you. Hold the drill down with one hand and run it at medium speed. With your other hand, lower a razor knife to the spinning peg to make a cut line for the peg's shoulder.

This is an important step because it prevents chip-out where the square portion meets the round part of the peg. You can also make the shoulder cuts with a chisel instead of a drill and knife.


Hold the drill against your bench and set the rotation to spin away from you
Taper end of peg with pencil sharpener
While the peg is spinning, lower a knife at the location of the shoulder to score a cut line


Handheld drill
Coarse-thread die, taper side down
Vise

Insert the die – taper side down – into a vise, switch the drill motor to spin forward, and run it at medium speed. Carefully run the peg stock through the die to cut the round section of your peg.

After drilling a round hole in my workpiece for the peg, I use a ¼" mortising chisel to square up the opening. Then, I hammer the peg into the hole to seat it. **PWM**

Steve McNamee
Troy, Michigan

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Each issue we publish useful woodworking tips from our readers. Next issue's winner receives a $250 gift certificate from Lee Valley Tools, good for any item in the catalog or on the web site (leevalley.com). (The tools pictured below are for illustration only, and are not part of the prize.)

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TOOL TEST

BY THE EDITORS

Random-Orbit Sander From Bosch

Two big improvements set this sander apart.

Less and more. *This new Bosch sander has less vibration than its competitors due to a dampening suspension, and much-improved dust collection with a canister containing a pleated paper filter.*

It's not often a random-orbit sander comes along that has significant improvements, but Bosch has released a new sander that has two, if not more. One is a unique vibration-dampening suspension system that isolates the motor from the parts you hold. The other is a dust-collection canister with a removable pleated air filter that traps more dust and is a snap to clean.

We all know vibration from prolonged sanding can seriously fatigue your hand and leave it feeling nearly numb. I've known woodworkers who wear gloves with built-in gel pads when sanding so as to get vibration relief.

Bosch claims this new sander (model ROS65VC) has reduced vibration from 40 to 260 percent in comparison to various competitors' tools. Anecdotally, our staff agreed the difference was significant. How did Bosch do it? The sander is made using two housings: an inner one for the motor and an outer for the grip and handle. Between the two are foam pads to dampen vibration.

Bosch Random-orbit Sander

Bosch Power Tools ■ boschtools.com or 877-267-2499

Street price ■ $235

▶ **BLOG:** *Read more about the Bosch sander and other thoughts on sanding at popularwoodworking.com/nov11.*

Price correct at time of publication.

Equally significant is a dust collection system that's new to this category. Important to effective dust collection is a filtration system that can breathe. But as dust gets collected, the filtration clogs, air flow is reduced and less dust is sucked into the filter (and more is sucked into your lungs). Most random-orbit sanders have a cloth collection bag that's usually small, so it clogs quickly. If you don't empty and clean the bags frequently, the dust collection capacity is compromised.

Bosch's pleated paper filter significantly increases the surface of the filter medium. It's easy to remove it from the screw-off canister cap, and the design of the paper folds make it easy to remove dust from the surface. What's more, you can see through the plastic canister to monitor how much dust is inside. There's also a baffle near the opening where it attaches to the sander, and that reduces the amount of dust that can spill back into the sander.

Easy cleaning. *The large pleated filter is easily removed for quick, efficient dust disposal.*

The ROS65VC also comes with a vacuum-hose adapter, so you're not limited to canister collection. Options include either a 5" or 6" sanding pad, which are easily switched. It is beefier than most sanders in this class, weighing nearly 5 pounds (up to 1.5 pounds more than most). I found the larger pad removed stock at a rate comparable to the larger pad size, or about 37 percent more.

— Steve Shanesy

CONTINUED ON PAGE 18

PHOTOS BY AL PARRISH

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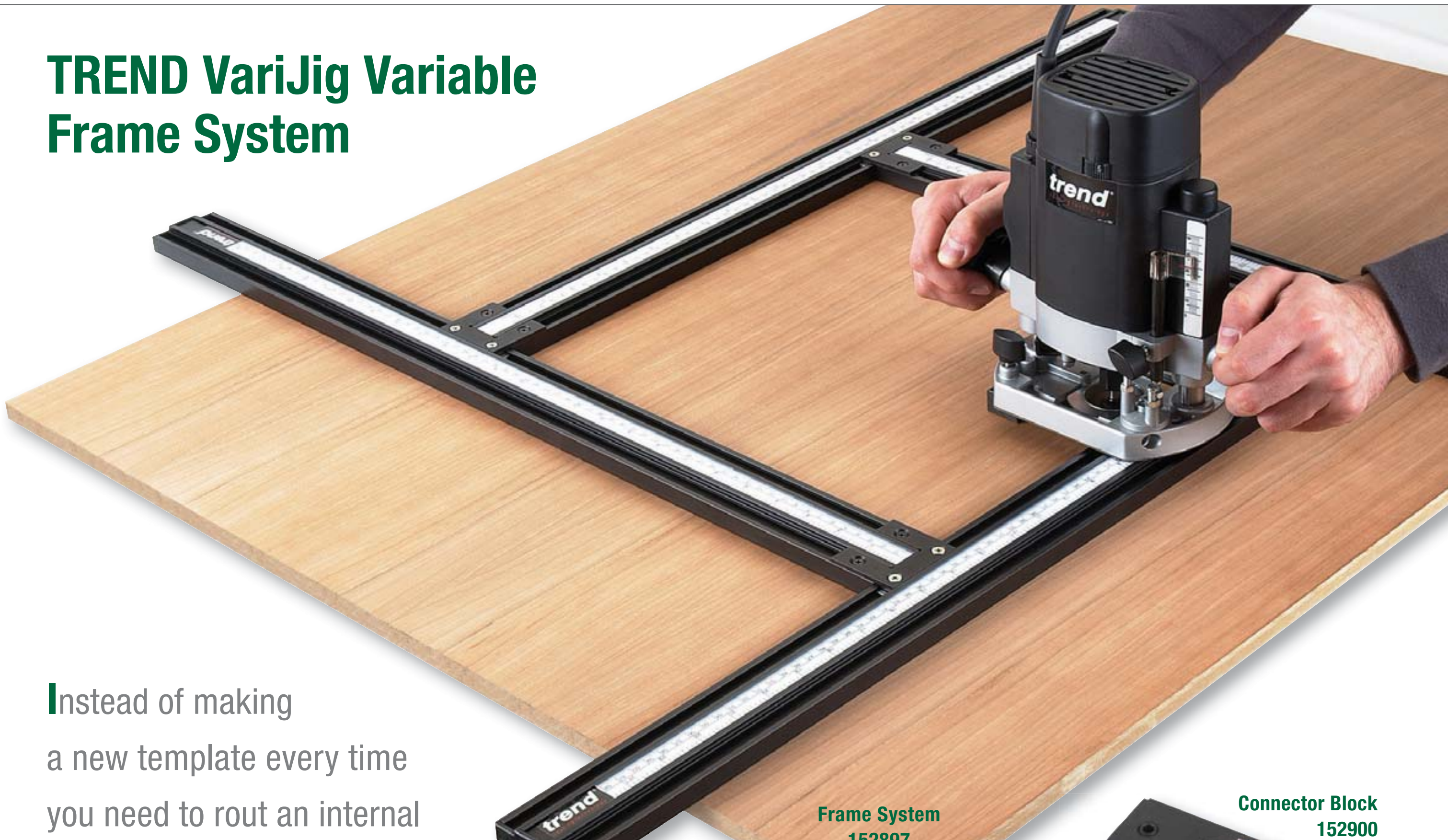

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CONTINUED FROM PAGE 16

Benchcrafted Double-screw 'Moxon' Vise

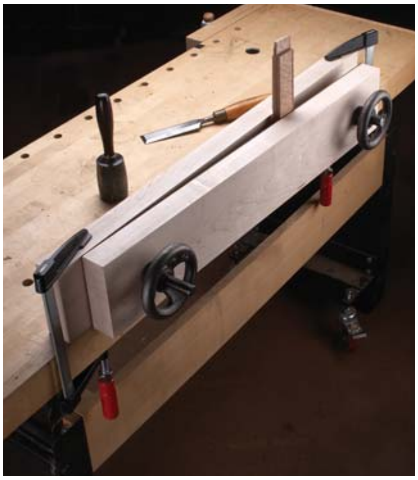
In the December 2010 issue of *Popular Woodworking Magazine* (#187), Christopher Schwarz wrote about building the all-wood double-screw vise from Joseph Moxon's "Mechanick Exercises" (1678). This vise is a back's best friend; clamp it on the edge of your bench, and use it to raise your work to a comfortable height for working on the edges.

Now Benchcrafted has developed 21st-century hardware that makes the double-screw vise more functional and eliminates the need to fuss with a thread box and tap (they can be fussy). Plus it looks cool and it works like a dream.

While the 8" cast iron handwheels and polished 3/4" x 8 threads-per-inch acme threads impart a high-tech look, they also function differently from our all-wood version. Here, the screws are locked with nuts into mortises in the back chop and the wheels move in and out on the screws. The moveable front jaw (which is lined with suede to protect your workpiece) doesn't weigh down the movement as it does on our wooden-screw version.

But what I appreciate most is that the narrow screws allow room to elongate the through-holes in the front chop side to side, so you can skew the chop to hold tapered work in place with ease. Or, use this functionality to set one wheel for the thickness of your workpiece then spin the other wheel in and out to clamp and release your work. One spin is all it takes to lock your work tightly in place.

— *Megan Fitzpatrick*



Benchcrafted Moxon Vise

Benchcrafted ▪ benchcrafted.com

Street price ▪ $149, hardware only;
$299, hardware and wood

▶ **VIDEO:** *See the vise in action; link at popularwoodworking.com/nov11.*

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Senco 18-gauge Cordless Brad Nailer

With no cords to attach and no cartridges to replace, this 18-gauge cordless brad nailer from Senco is a handy tool for quick nailing jobs in the shop, or for use on jobsites when no compressor is available. The "Fusion F-18" runs off a Lithium-ion battery, so if you charge it after every use, it will be ready to use when you need it.

The easy-to-access magazine holds 110 straight brads, and accepts fasteners from $\frac{5}{8}$" to $2\frac{1}{8}$" in length. A lockout feature prevents dry firing when it's time to stop and reload.

One battery (and a charger) are included with the tool, and in 15 minutes, the battery is charged to 80 percent. A full charge takes 45 minutes. With a full charge, I shot 577 $1\frac{1}{2}$" brads in yellow pine before the battery needed juicing (but you don't need to keep count; an indicator light on the back of the battery tells you when it's time to charge).

Sure, it can handle pine – but the Fusion F-18 also had no trouble fully sinking $1\frac{3}{4}$" brads into white oak and hard maple.

There are three drive settings: on/off, contact actuation and sequential, and you can, of course, adjust the depth of drive.

One thing that's noticeably different about this gun is that the fasteners shoot out $\frac{1}{4}$" behind the nose guard – you'll need to get used to that.

At 6 pounds, the gun is a bit heavy for all-day use – but for occasional use, or for a shop with no compressor, this tool is an excellent choice. **PWM** — *MF*

Senco Cordless Brad Nailer

Senco ▪ senco.com or
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▶ **BLOG:** *Read more about this nailer at popularwoodworking.com/nov11.*

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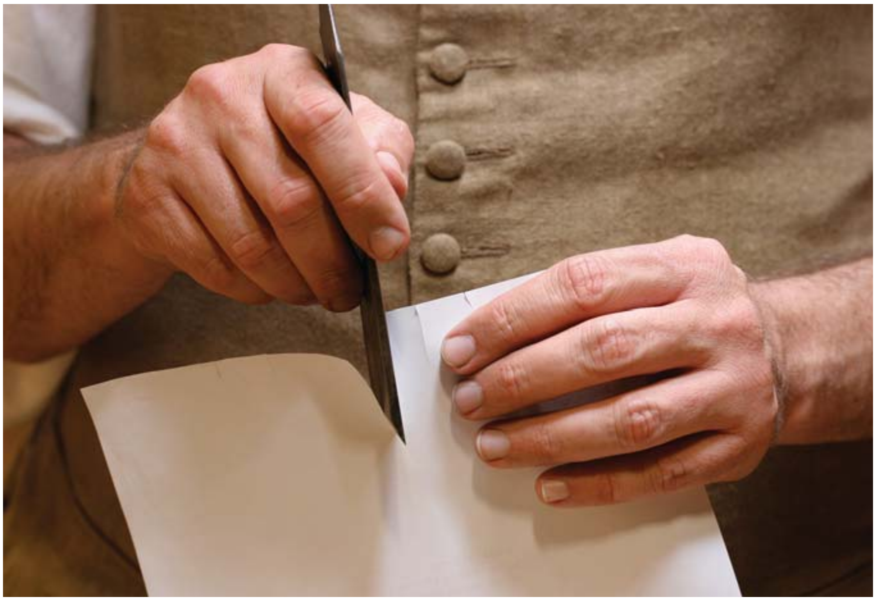
BY ADAM CHERUBINI

Keep Your Edges Sharp

Part 2: Test often to avoid the need to grind.



The paper test. *During a day in the shop, I periodically perform two tests on my edge tools using scrap paper. When they fail a test, I know it's time to hone.*

To determine if the edges are sharp on my blades, I perform two tests (depending on the tool) using scrap paper. I first draw the blade across the edge of a piece of paper, listening for the growl of a ragged edge. The blade should be able to slice the paper cleanly. You'll be able to hear when the edge of your tool is smooth. Edges that pass this test are good enough for work in hatchets, drawknives, spokeshaves and other tools that are drawn through wood. For chisels and plane irons, however, I perform a second test. If my chisel or plane blade passes my first test, I then push the blade straight down onto the edge of the paper. A sharp tool will easily cut through an entire sheet.

The nice thing about the paper test (or any test like this) is that it is results-based, not process-based. Though this may sound odd coming from me (because I'm a process-based woodworker), when it comes to sharpening, I'm interested only in the bottom line.

Grinding

Only when a bevel angle is many degrees too high or an edge is badly damaged will I consider a powered grinder.

I'm not against grinding – I just think if you maintain your edge by honing before a tool becomes unusable, you and your tool will be better off. That's why I stop periodically throughout a shop session to perform my paper tests.

I've taken the advice of others when it comes to powered grinding. My friend Joel recommends cambering the face of your grinding wheel slightly. This functions the same as a smooth plane iron (when cambered) and for the same reasons. There's always a chance that a square-faced wheel can cut a little groove in a wide tool (at least theoretically; I don't think I've ever done this). You can use the camber to remove the high spot from one side of a tool much like you can slide a try plane sideways to correct an out-of-square edge.

I imagine Larry Williams (of Old Street Tool) does a lot of grinding and he always stresses dressing your wheel with a diamond stone dresser. Like clean whetstones, grinding wheels need to be kept clean to function properly (clogged stones can overheat tools).

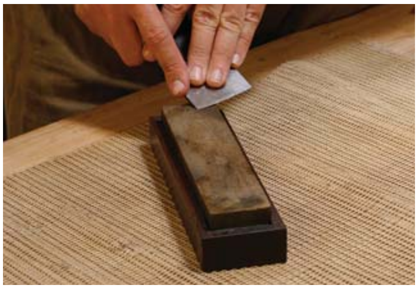
The only other thing I stress is that when dry grinding, use very light pressure while holding the tool to the wheel. Sometimes the weight of the tool is sufficient (I may be exaggerating but not by much). If you find you're overheating your tools, dress your wheel then use a much lighter touch.

Maintaining Edges

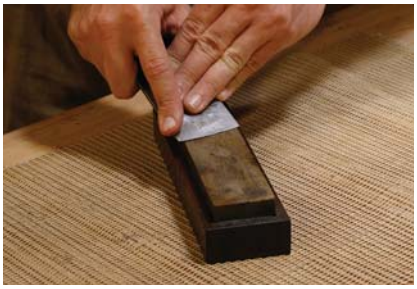
The key to avoiding frequent grinding is to maintain your edges with regular honing. This requires tool sympathy – the sense for how well your tool is cutting. It also requires a quick and easy honing regimen that you can invoke for a two-minute job. This might mean a dedicated sharpening area in your shop or a sharpening system that is quick and convenient. For most jobs, I use two stones: my ouachita and my hard Arkansas. I squirt each with a small amount of WD-40, I hone, then clean up each stone with a paper towel. For me, the less stuff I have to get out of the drawer the better.

One more thing about maintaining edges and sharpness: As an edge dulls, bits of steel fall off and others deform, roll back or roll under. This leaves micro cracks and an irregular surface along the edge. The micro cracks are like perforations in a paper towel roll – weak points where the next failure will start. By honing frequently, we can reduce the weak points and maintain an acceptable edge much longer by preventing small imperfections from growing into larger

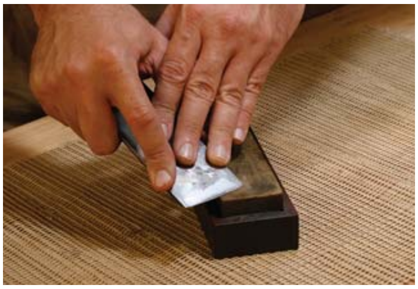
PHOTOS BY THE AUTHOR



Roll into it. *When working curved or cambered blades, I try to hone the full arc with each stroke. I begin at one corner and roll the blade as I push.*



Halfway. *Midway through each stroke, I'm still holding the blade slightly askew. A rubber mat is all I need to keep the stone from sliding around on my bench. I'm using a fair bit of pressure; that helps the stone stay in place.*



The big finish. *I finish my honing stroke on a cambered blade by rolling to the far side of the blade. It's motion akin to rubbing the inside of a bowl.*

ones. If you work with dull tools, the edge will break down faster. We might want to keep this in mind as we race toward more durable (and harder to hone) steels for edge tools.

Stropping

Stropping is the process of polishing tools on a piece of fine abrasive. Leather is typically used, though corrugated cardboard will work. Stropping can gently remove a wire edge left by sharpening stones. Because traditional strops are flexible, many worry that the process "dubs" or rounds over the edge we just sought to flatten on our stones. I suspect there's truth in that concern, though I'm less concerned than some about the effect (see my October 2011 article on sharpening). In fact, I feel the flexibility of the strop is its chief advantage. A flexible strop polishes whatever surface you have. It doesn't seek to straighten the edge. I use a piece of craft store suede glued to a piece of MDF with contact cement.

On Bluing Tools

Tools turn brown or blue when they are overheated. The brownish color is created at about 500° Fahrenheit (F) and the blue at nearly 600° F. Depending on the specific alloy of steel, this is either bad or really bad. When tools turn colors like this during grinding, they have been locally retempered, which reduces the hardness of the steel.

The color shows up on the surface and can be polished away, but the damage extends through the thickness of the tool. The damage also extends beyond the recolored area. Welders call this the "HAZ" or Heat Affected Zone. The damage could be $\frac{1}{32}$" to $\frac{1}{16}$" beyond the discolored (retempered) area. When this happens, you can either ignore it and hope for the best or grind the edge back to the discoloration and a bit beyond to account for the HAZ. Frankly, I usually ignore the problem and hope for the best. But that tiny corner I blued will almost certainly crumble at the next use. If it's blue, I could have lost three points on the Rockwell hardness scale. I'm not afraid of my grinder and can do a decent job with it. But I think it wise to avoid grinding whenever possible. — AC

I've charged my strop with chromium oxide polish (available from Lee Valley). But you don't need anything elaborate. A piece of (unused) shoe leather works fine, too. Like frequent honing, a quick swipe across a strop can go a long way in preserving an edge. If your edge doesn't pass the paper test on the first try, strop first.

Conclusion

I hesitate to suggest that what I've offered here is new or different. But I was moved to write to counter the cacophony of voices convinced that only tools with perfectly flat backs are usable and that each sharpening requires considerable effort, lots of equipment and fancy new stones. So just a quick recap:

Flat backs are not necessary for an edge tool to cut efficiently. Carving tools typically don't have flat backs. You really can just polish the last $\frac{1}{4}$" of a tool and your tool will function just fine.

A convex bevel is stronger than a flat or concave bevel, at least on paper, and is generally easier to hone because less metal is worked. But this is nothing new. It's essentially the same as a microbevel (or perhaps vice versa).

Old-fashioned Arkansas stones can do a good, quick job of preparing such edges because the amount of metal removed is miniscule. You can push pretty hard on the stone without worrying about digging a trench because the matrix is so hard. If you are working with cambered blades or carving tools, the harder stones won't be damaged. Save your waterstones for large, flat surfaces.

"Grinding" is not a bad word in my shop, but honestly it's not without its risks. I don't think it should be a regular part of your sharpening regimen. It certainly doesn't need to be.

Lastly, you don't need miracle steels to have an edge stay sharp for a long time. If you make honing part of your work and not a separate activity only done between jobs, your edges will last longer and be sharper during use. The simplicity of an old-fashioned whetstone or leather strop allows me to hone without breaking my work pace or concentration. **PWM**

Visit Adam's blog at artsandmysteries.com for more discussion of traditional techniques.

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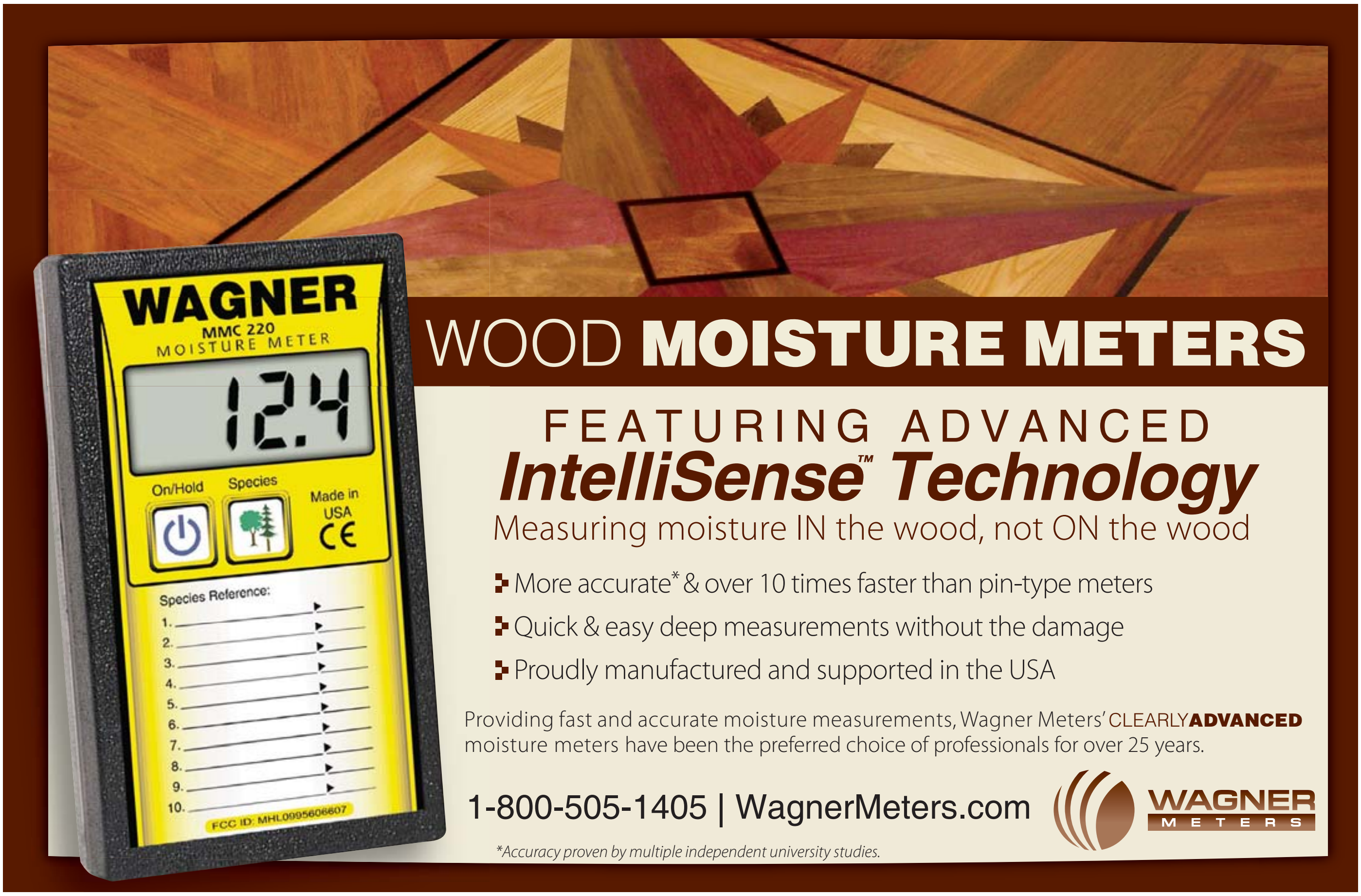

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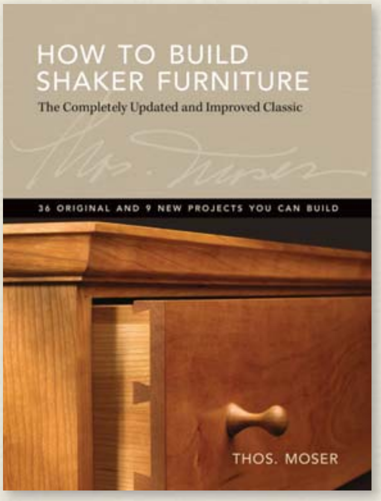
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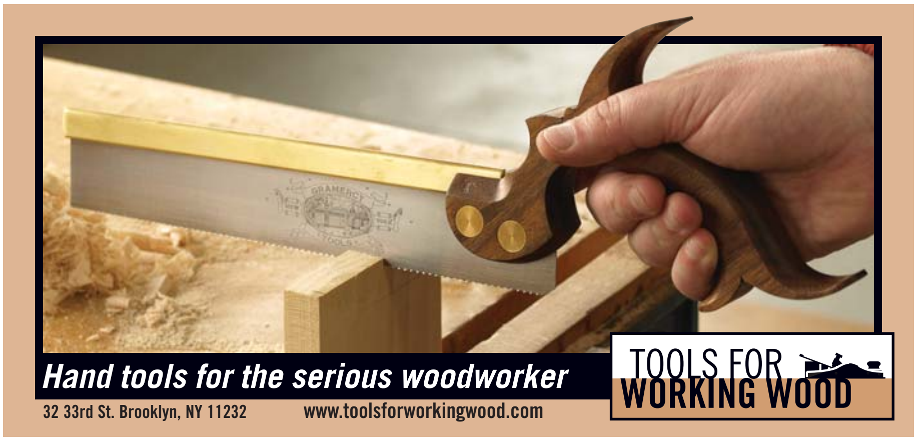

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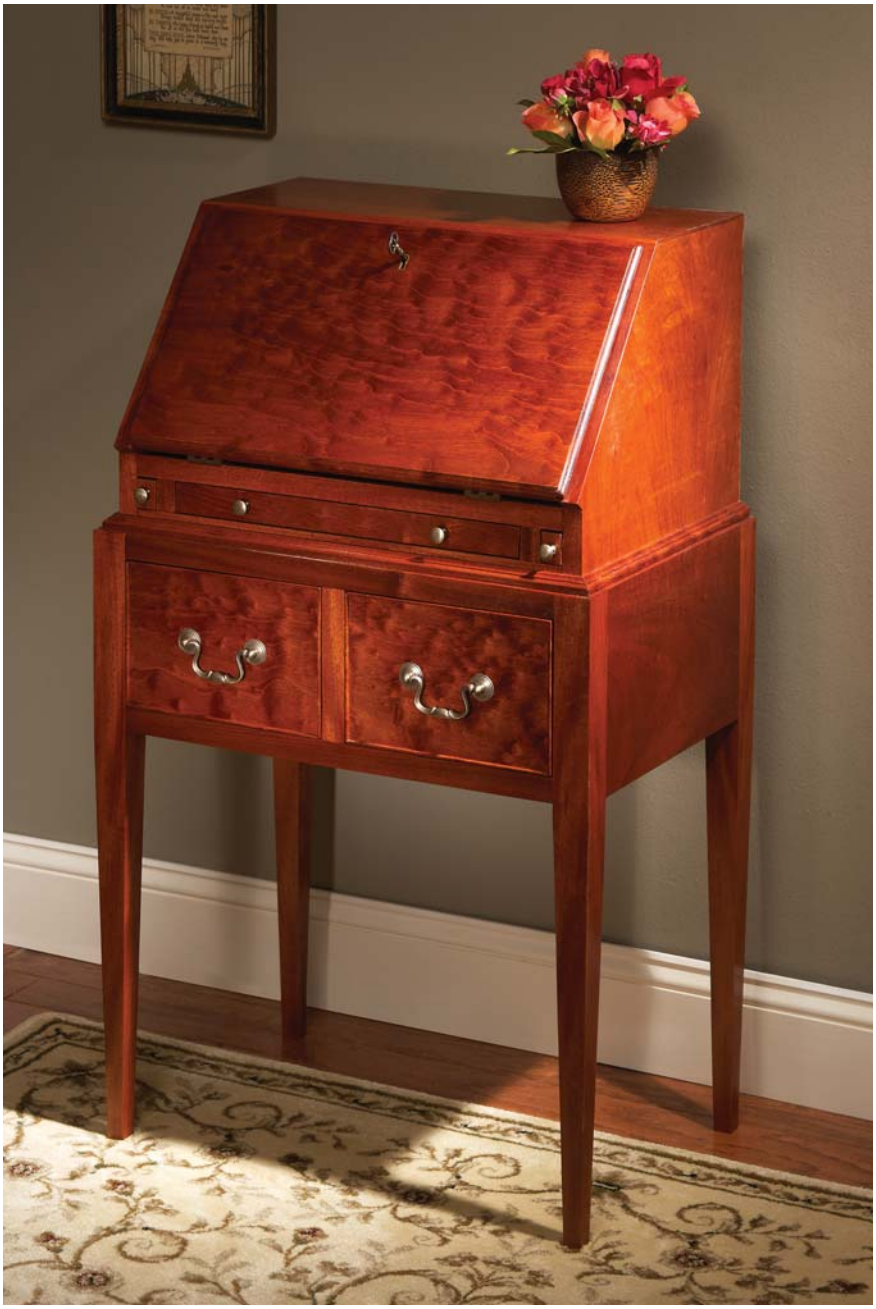
Southern Lady's Desk

BY GLEN D. HUEY

This North Carolina beauty exemplifies the style of the early South.



Substantial storage in a small size. *While you can see only three drawers when the lid is closed – that's right, it's a pencil drawer between the lopers (the lid supports) – the interior of this mahogany desk is chock-full of small drawers and compartments.*

I don't consider myself a furniture snob, but until recently, I'd not studied furniture from the South beyond pieces featured in "Southern Furniture 1680-1830: The Colonial Williamsburg Collection" by Ronald L. Hurst and Johnathan Prown (Colonial Williamsburg). After spending a few days combing through file cabinets at the Museum of Early Southern Decorative Arts (MESDA), I found I've been missing a vast array of gorgeous furniture.

As we pored over candidates for our upcoming "Furniture in the Southern Style" book, this small secretary, called a "Lady's Desk" in the MESDA files, immediately caught my eye. I like its petite size and the slender, tapered legs. It doesn't hurt that the piece has two amply sized drawers that are great for storage, or that there is far more eye candy behind the drop front. And most of the parts are, like the investment in materials, small.

Get the Ball Rolling

Because the leg tapers are cut to 3⁄4" at the floor, it appears as if the desk is standing on its toes. It's important to get the four-sided tapers correct to mimic the ballerina effect. Mill your leg stock to size making sure the pieces are square, and cut all four legs to a matching length. Tapering is, for me, a jointer operation – but no matter your method, make sure your tapers all match.

The grain changes as you taper – so I don't cut mortises until my tapers are made. Position your tapered legs for the best look, then mark the legs for the appropriate mortises.

The mortises for the split tenons at the base back and side rails are identical: 3⁄8" wide x 3 1⁄4" long; they start 1⁄4" from the top and bottom of the overall width of the rails (with 1" of material left between them). The front legs are mortised to accept upper and lower rails that are 7⁄8" thick and 1" wide. These mortises are 1⁄2" in length, and 1" deep.

LEAD PHOTO BY AL PARRISH; STEP PHOTOS BY THE AUTHOR; ILLUSTRATIONS BY ROBERT W. LANG

> *"We work to become, not to acquire."*
>
> — Elbert Hubbard (1856 – 1915)
> American writer, publisher, and philosopher

Two Tenon Methods

Prepare the material for the back and side rails, and at the same time mill the pieces for the front rails and the drawer divider. Cut the rails to size then form 1"-long tenons on both ends. The drawer divider ends get ½"-long tenons. For the narrow front rails, I find it best to use a two-step method at my table saw. Define the tenon length and make the shoulder cuts with the stock flat on the table, then make the cheek cuts with the piece standing vertically in a tenon jig. (Don't forget the centered ⅜"-wide x 1"-long x ½"-deep divider mortises in the top and bottom rails.)

I use a dado stack to make the tenons for the wider rails. With this method, all cuts are with my workpiece flat on my table saw. You need to sneak up to the final blade height – and unless you have a really wide dado stack, each tenon has to be cut in two passes. Set your fence for the final tenon length to keep from overcutting. Once you get the blade height set, cut all the tenons. Any additional fitting should be done using a shoulder plane.

While the narrow rails come off the saw ready to install, the tenons on the sides and back piece need to be split. No need to measure – just align a rail to its leg mortises, then transfer the layout onto each tenon.

From those marks, extend straight lines down the tenons. You could use a band saw to make the cuts, but it's so easy to use a handsaw here. The cuts are not critical – but don't nick your shoulders. Grab a chisel to remove the waste from between the tenons. A couple hits in from both faces should do the trick, and you can saw off the end waste.

Before you dry-fit the base, there's a mortise needed through the back to catch the center drawer runner. I butt the back atop a couple 2x4s on my mortise machine bed, then set the fence and cut the mortise through the back piece.

Dry-fit the base to make sure all the joints close and the parts are correct.

While the unit is together, take measurements for the outside runners and center drawer runners. Remember to install the center runner as you glue-up the base. If you do forget, there are options – a bridle joint or a clever slip fit. (You can read more about that on our blog – check the Online Extras for a link.)

Join the three parts for the base front, then cut the runner mortise in the lower rail. Apply glue on each tenon and in each mortise, then assemble the base. It's best to first connect the front and back rails to the legs. After the glue dries, complete the base assembly. Fit and install the runners then cut, fit and install drawer guides using brads and a little glue.

Interesting Joinery Ahead

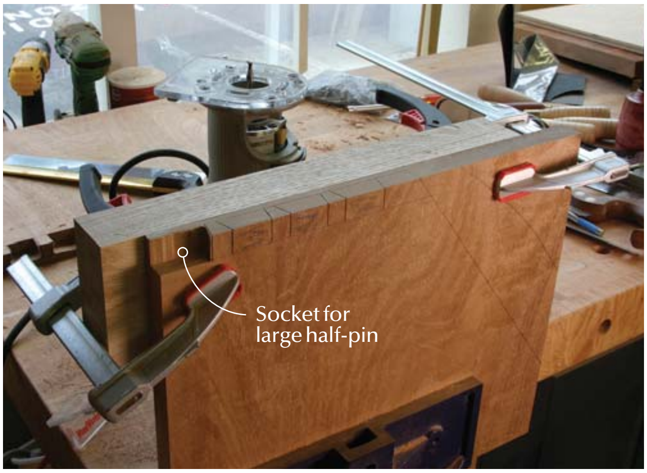
To begin the upper desk work, thickness and cut the desk sides and top to size, but leave the top long (it will be trimmed later). The side width is taken right from the assembled base. A little layout work helps to determine the dovetail sockets for double-blind dovetails. The desk lid area is angled at 36.9° off the front edge – or measure 3¼" up the front and 8⅛" from the rear along the top edge, then connect the two points.

Create the dovetail pin-board sockets just as you would in half-blind dovetail joinery. Use a large half-pin at the front where the slope begins, and a large half-tail at the rear of the socket area as shown in the photo below. It's best to leave your pin areas on the wide side (⅜" or more) to make waste removal on the tail board a bit easier.

Take another look at the photo below. You'll see that the sockets sides are not over-cut beyond the scribeline – which I recommend on most dovetails. But overcuts would be visible as you look into the end letter compartments, so refrain from this common practice for this build. Because this makes these dovetail sockets slightly more work, I

Added strength. *The solid area between the two mortises is 1" long. In a rail this wide, split tenons should be used for strength and rigidity.*

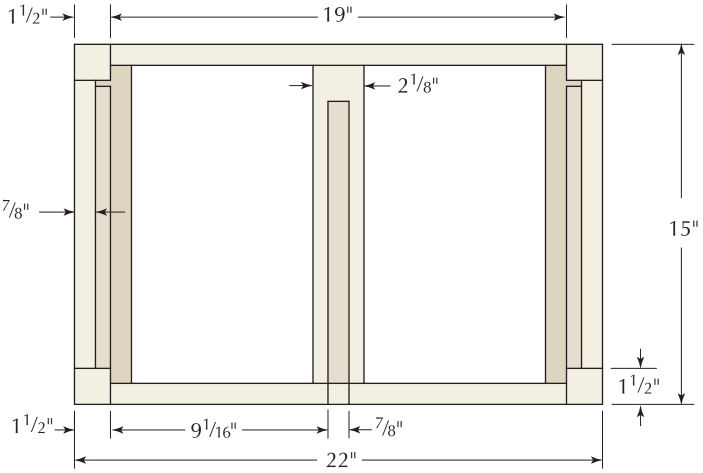
Not so tight. *A small space between the tenon and mortise allows you to adjust the rail up or down to fit flush with the top of your legs.*



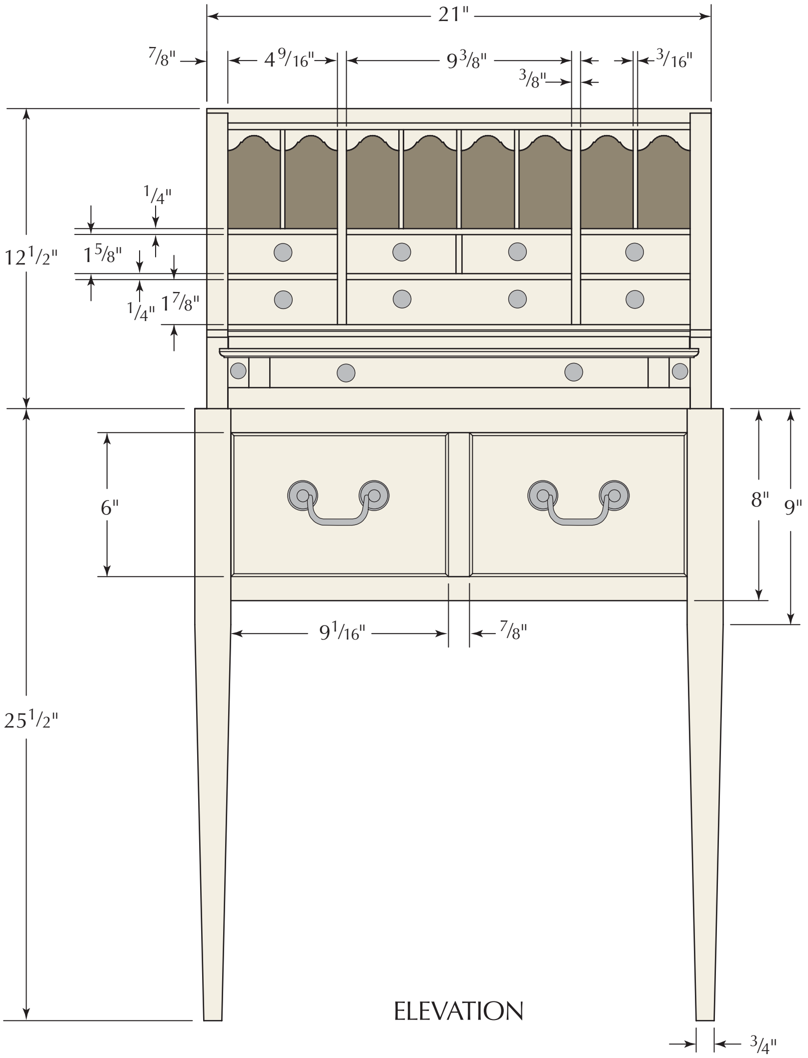
Powered waste removal. *Using your router and a small diameter bit, you can work tight to the scribeline and hog out much of the waste just leaving a bit of chisel work to finish the sockets.*

decided to approach them differently.

First lay out the sockets setting the scribe line at 1/8" less than the thickness of your desk's top, then define the sockets using your dovetail saw. Slip a side into a vise to hold the piece vertical and clamp a wide piece of stock flush with the top edge of the workpiece to provide support for a router. With a 1/4"-straight bit loaded in your router, adjust the depth of cut so the bit just reaches the scribe line. Carefully remove the waste making sure to stay inside the saw cuts. Finish to the lines using chisels.



BASE PLAN



ELEVATION

With the top dovetail sockets cut, flip the sides end-for-end to lay out and cut the sockets for the desk frame pieces that secure the sides at their bottom edges. The rear frame piece is set 5/8" in from the back edge while the front piece is held back 1 1/4". Saw the lines then remove the waste using a chisel. Now cut the sloped front for the desk lid. Use a band saw to cut close to the layout lines, then use a plane to trim right to the lines, working up the slope.

Mill the frame parts according to cut list, then set the sides in position on the frame pieces to transfer the layout. Create the large dovetail on both ends of the frame pieces and dry-fit the parts to the desk side. Don't glue them in place yet – they get more work later.

The top of the desk is where the real joinery changes are found. While you could attack this as a regular half-blind dovetail joint and leave the joinery exposed, I stayed true to the original. As you look down on the desk, you don't see any dovetails – it's not a common joint, especially in this application.

Your out-to-out measurement at the top needs to match what you have at the bottom with your frame pieces in place. Cut your top to that length plus 1/32", to make sure you cover any end grain on the sides.

Next, rabbet the ends to create a lip to cover the lap on the pin board – the distance between the dovetail socket and the edge of the board. Measure that area then add 1/64" to the figure. Set your table saw fence to cut at that measurement, raise your blade to leave 1/8", then trim away the material to form the rabbets.

With the rabbets made, work the dovetails as normal. Set a marking gauge to match the depth of the dovetail sockets, balance the sides on the upside-down top then transfer your layout. As with the pin board, define the tails with your saw, but don't overcut the baseline, and don't nick the lip. Those nicks will live forever.

I again turned to my router to hog out the waste material. If, as I suggested, you

Easy hold. *Handscrews grip the ends of the desk sides and hold them tight and vertical to make dovetail layout transfers a snap. Your dovetail layout can vary – as does mine between the workpiece and the drawing.*

The great cover-up. *A lip on the ends of the desk's top covers the lap of the dovetail socket area to form a full-blind dovetail joint. It's invisible holding power.*

used 3/8" (or more) as your pin width, the same 1/4" router bit will travel between the tails to cut away most of the waste. Pare residual waste with your chisels. Test your fit and trim as needed. Keep in mind that this joint is totally hidden so the fit doesn't have to be dead-on perfect (but do strive to avoid a sloppy fit).

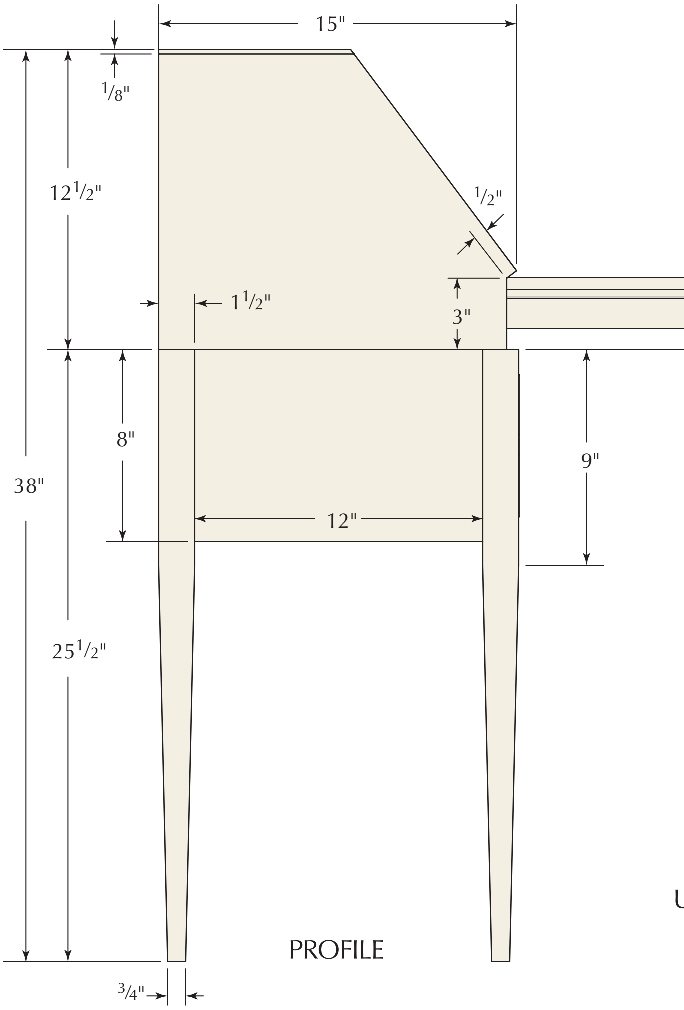
With the top fit to the desk sides, use a straightedge to continue the slope of the sides across the ends of the top. Adjust the tilt of the table saw blade to match the slope angle, then trim the top at those lines (if you're off a hair don't worry – a handplane can make small corrections). Your top now has a sharp pointed edge that has to be trimmed. From the outside face of the top, move 1/2" down the slope then square a line down the edge of the workpiece. Use a straightedge to connect the two lines on both faces, then clamp the piece at your bench before planing to the lines. Dry-fit the top back to the sides (no glue yet – there's more work to do).

Get Inside the Desk

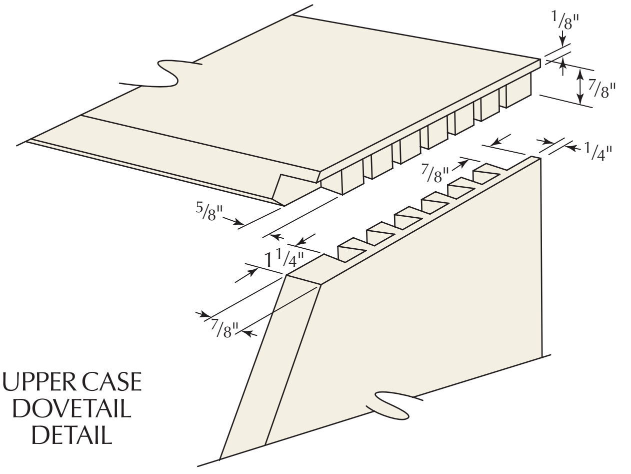
There are dozens of dados to cut on the inside of the desk. A couple are cut using a dado stack; the balance are routed using simple shop-made guides. But before getting to that, you need to do some layout work on the sides.

The interior writing surface is 7/8" thick and begins 2 1/8" up from the bottom edge. Mark the location on the inside of one desk side, then continue lines onto the front edge, even though this piece rests in stopped dados. Transfer the front edge of one side to the front edge of the second side. Square the marks back on the inside face of both desk sides.

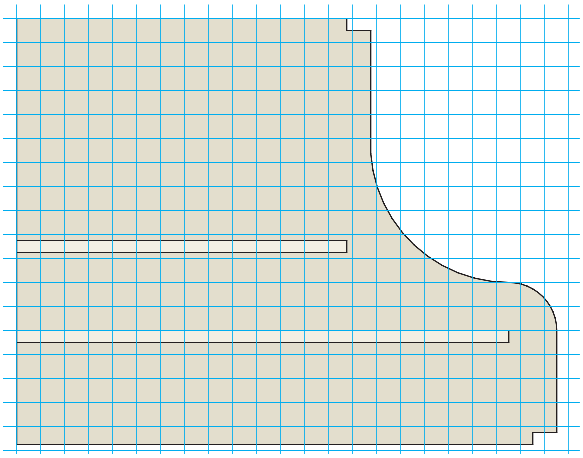
Next, set a combination square at 1/2" then slide the square along the slope until the end of the rule touches the upper line of the writing surface dado.



PROFILE

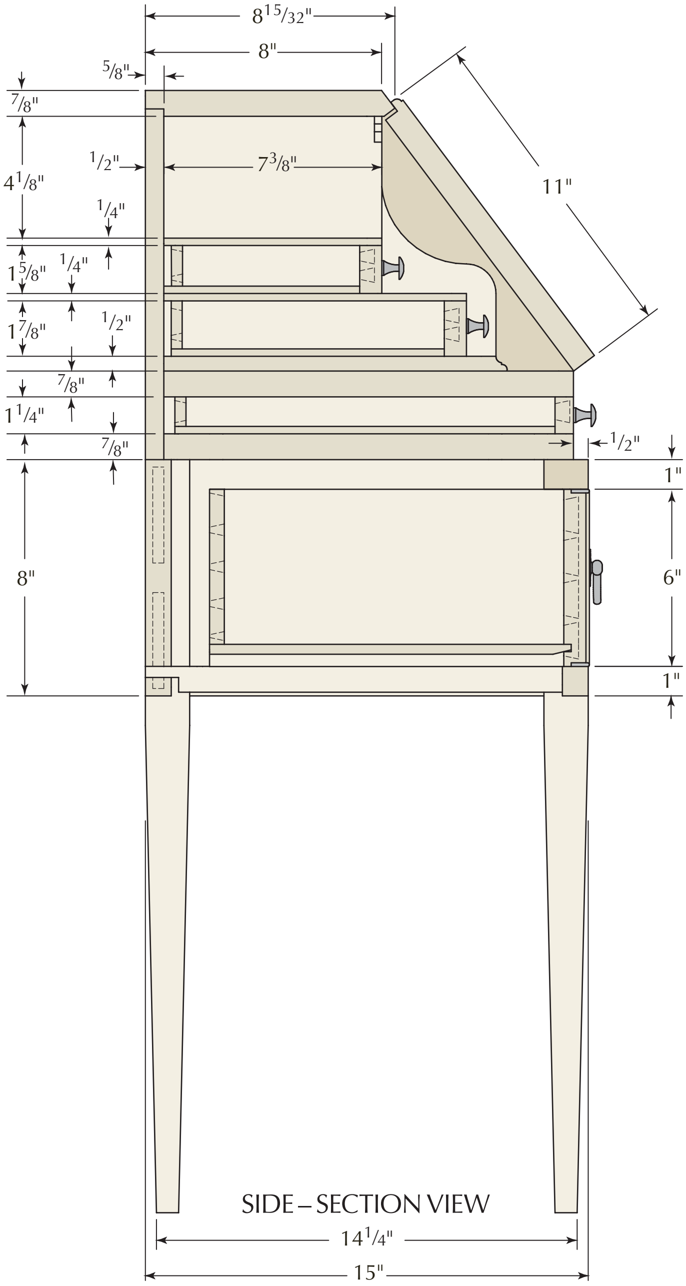


UPPER CASE DOVETAIL DETAIL

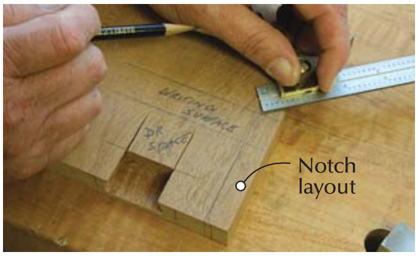


GALLERY DIVIDER

1 grid square = 1/2"



SIDE – SECTION VIEW



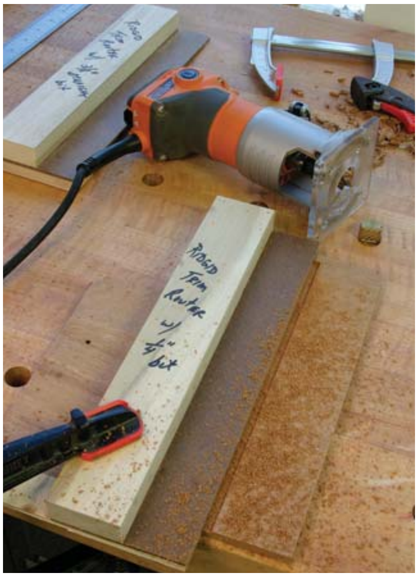
On-board calculations. *A combination square set to the thickness of the lid minus its lip, plus some layout work, shows exactly where to trim the waste.*

Draw that line onto the sides as shown above then square up from the bottom edge to the intersection of those layout lines. The small area is the notch you'll trim off the sides – but don't cut it yet.

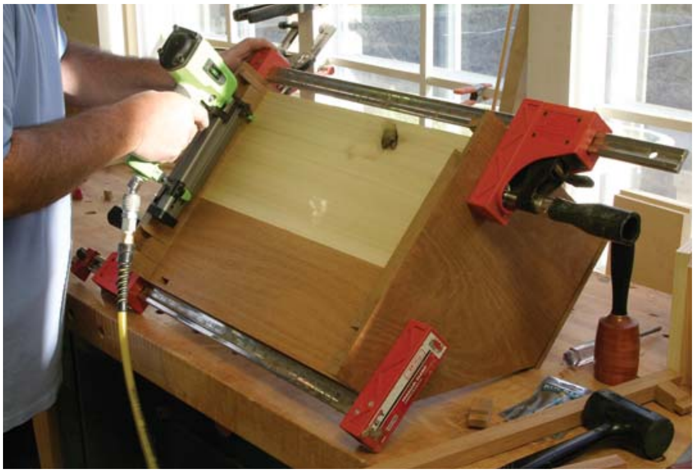
At your table saw, install a dado stack. Because most stacks will not cut 7/8", these cuts need to be completed in two steps. First set the depth of cut. Next, with the saw unplugged, find the start and stop points of the blade using a square against the fence and blade, then mark the reference lines on your table saw fence. Use the layout on the front edge of your desk sides to align the blade with the top edge of the writing surface dado. Set your fence at that point.

Before you cut, mark a line along the bottom edge of the side's face 1" from the front edge on both workpieces. That line is the start/stop line that meets with the reference lines on the fence. To make the dado, one side drops onto the dado stack so the two lines meet, then pushes through the workpiece. The other side will use that meeting point to stop the cut. Dado both sides before adjusting the fence to cut at the top edge of the layout. Clean out and square the dados.

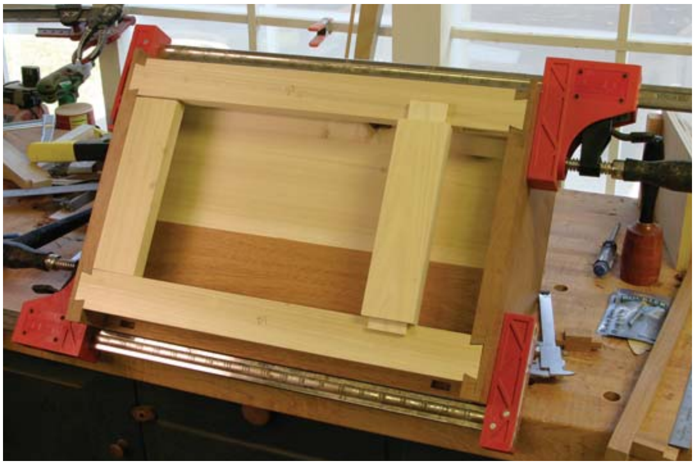
It's two steps. *Whether you're using a dado stack or a router and straight bit to make the dados for the writing surface, you'll have to make a second pass – unless you have a 7/8" straight bit.*



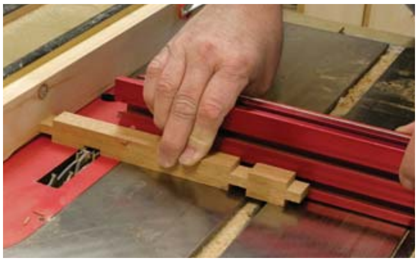
Shop workhorse. *Router jigs are used to make dados throughout the inside of this desk. They are so simple to make that you should have one for each different router bit diameter.*



Quick clamps. *Because they cannot be seen in the finished desk, drive $1\frac{1}{4}$" 18-gauge brads from underneath to secure the writing surface to the upper section's sides.*



Both fixed & movable. *The frame rails fit into $\frac{1}{2}$"-deep mortises at the front (they are glued for strength) and into 1" mortises at the rear. The back mortises are free to float to accommodate seasonal movement.*



Save your fingers. *A dado stack and a long workpiece quickly becomes two small, ready-to-use loper dividers, given a bit of creativity.*

Before returning to the bench, cut the notch at the front edge of each side. I used a band saw and cleaned up the saw marks using light touches with a rasp.

There are two gallery shelf dados cut into the desk sides. For these, because they are only $\frac{1}{4}$" in width, I use a trim router guided by a shop-made jig, as shown in the photo above.

Lay out the location of the two dados, marking both the top and bottom of the dado. Make sure the two sides match. Set and secure a jig to the left of the dado – in normal use, router bit rotation forces the router to the left. The lower dado is $10\frac{3}{4}$" long; the upper is $7\frac{3}{4}$". Cut the four $\frac{1}{8}$"-deep dados then use your chisel to square the ends. To complete work on the desk sides, cut a $\frac{5}{8}$" x $\frac{1}{2}$" rabbet to accept the backboards.

Bottoms Up

Cut and size the writing surface (the panel that's under the gallery) according to plan. Only $2\frac{1}{4}$" of this piece is visible, so to save material costs, glue a piece of 3"-wide (or wider) primary wood to secondary wood. Each end of the panel needs to be notched at the front edge to fit in the $\frac{1}{4}$"-deep dado. I made the cuts at my table saw using my regular saw blade and a sacrificial fence.

Before you install the writing surface, locate and cut the two mortises for the loper dividers on its bottom face. Make these mortises just as you did the center mortise in the base rail. To install the writing surface, put a small amount of glue at the front of the dado, fit the panel into your sides and clamp. Toenail with a couple brads for extra hold.

While you're working with the desk inverted, finish up work on the frame and frame rails. Cut your mortises and fit the tenons before installing the frame to the desk. Assemble the front mortise-and-tenon joints, slide the rear joints together then add glue to the large dovetails on the frame pieces. Slip the tails into the sockets (you may have to knock the rear joint out a bit).

The front rail and loper dividers are next. Mill your rail and cut the two mortises for the dividers. The dividers are small pieces, so take extra care when working with them. I find it best to cut the full-width tenons using a dado stack. Form a tenon on both ends of a longer workpiece, skip down $1\frac{1}{4}$" (the finished length of the dividers) then cut a second tenon as shown in the photo above. Use a handsaw to free the parts then do any fitting work with a rasp.

Next, add glue to your rail and writing surface mortises and on the loper-divider tenons, then slip the dividers into your rail. A thin bead of glue along the back edge of the rail secures it to the desk frame. Fit the divider tenons to the writing surface, use clamps to pull them snug, then clamp the rail to the frame.

After the glue dries, remove the clamps and attach the drawer guides to the frame rails. A dab of glue and a couple #8 x 1¼" wood screws per guide do the trick.

So Many Small Dados

Note: Gallery parts, except for the gallery dividers, are made up of pieces ¼" in thickness or less. These parts can be sawn from 4/4 stock, so you may want to get parts roughed out ahead of time. Also, many pieces can be a mix of primary and secondary woods, as the entire surface of each doesn't show in the finished desk.

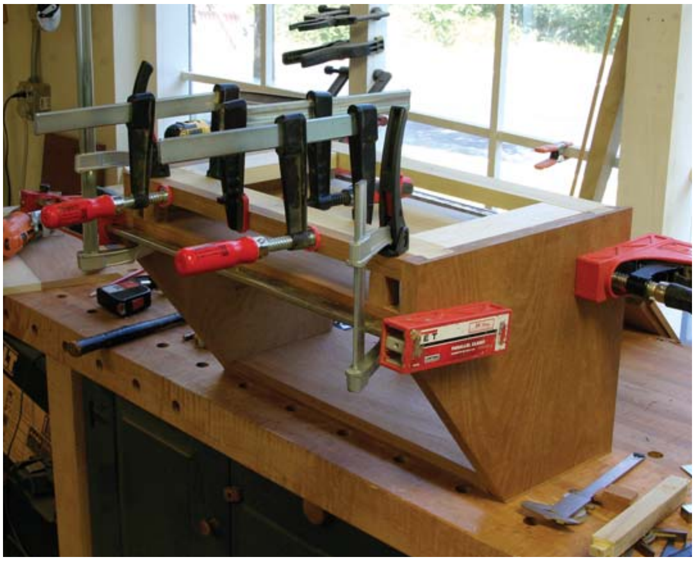
Mill the gallery base to thickness and width. The fit between the desk sides should be snug yet easily removed for work. Carefully measure and fit its length, then mould the front edge. Lay out the dado locations then rout the 10¾"-long dados for the dividers.

Use a square to transfer the dado location to the top (this is more accurate than measuring). With the marks transferred, rout the gallery divider dados in the top. Keep the ends of the dados about ½" from the front edge. This is a good time to cut a ⅝" x ¼" rabbet along the underside of the top's back edge, which hides any routed dados and provides a recess for the desk back.

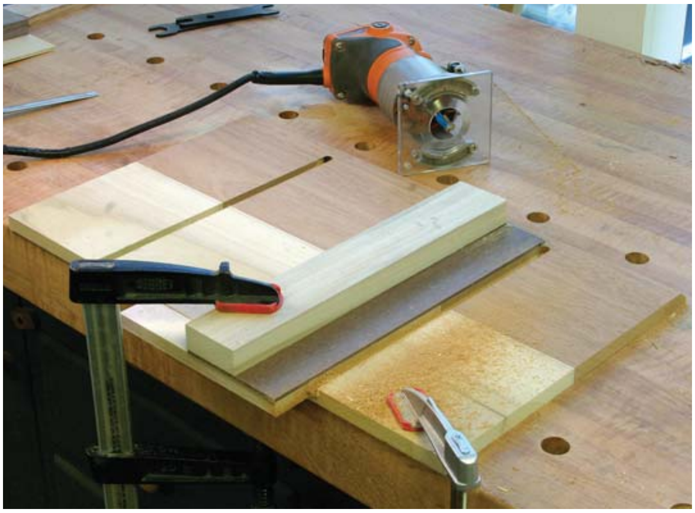
Mill the two gallery dividers to size and draw the curved design (see the pattern on page 28) on your workpieces. Cut and smooth the profile, and notch the front edge at the top and bottom to step out of the dados. Fit the dividers to the gallery base while it's installed in the desk – the desk's top should be loose if not removed. Find and mark the locations for the gallery shelf dividers. Again for accuracy, cut a scrap to the height of the dado in the desk sides, then use that pattern to mark each side of the two dividers. Repeat these steps for the upper shelves. Create the ⅛"-deep dados using the appropriate router jig and bit.

Next, mill and fit the gallery shelves to your project. You want a snug fit, but remember that each of these pieces is

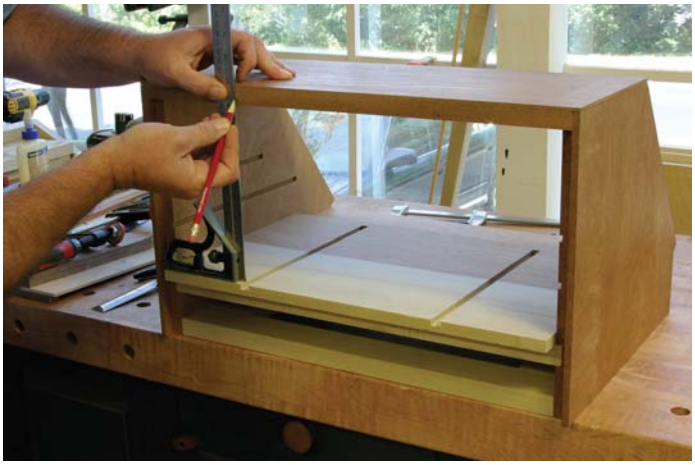
Dual-action clamping. *Because the desk front pieces need to be pulled both down and back, you'll need a lot of clamps to get the pieces tight to your desk.*



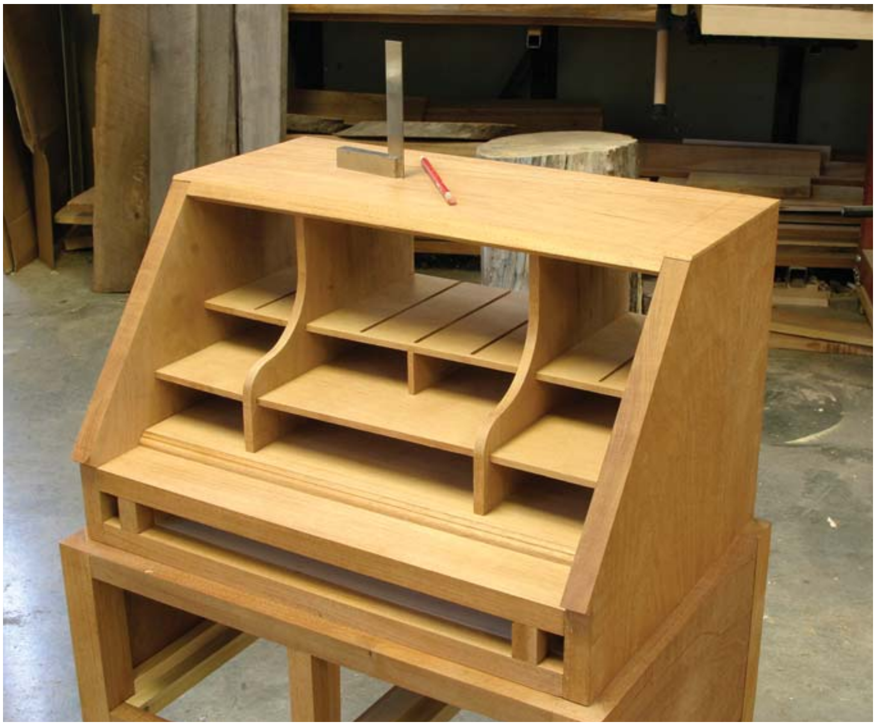
Inside, the beginning. *Rout the ⅜"-wide x ¼"-deep dados, staying ½" back from the edge even though the dividers fit tight to the moulding work.*



For the best accuracy. *Slip the gallery base into the desk with the top in place, then use a square to transfer the dado locations to the underside of your top.*



Dead-on cuts. *A sacrificial fence and your regular table saw blade allow you to repeat the many cuts needed to fit the gallery pieces into their dados.*



Again for accuracy. *After the $^{3}/_{16}$"-wide letter dividers are routed in the upper shelves, transfer the layout to the underside of the top using a small square.*

installed and removed a number of times. Fit them so they easily slip in. Keep the shelves wider than needed, notch the ends to fit the dados then mark the final width and trim to fit.

The center, lower shelf has a dado in its top face for a small divider that splits the upper section into two drawers. With that dado in place, again use a square to transfer the position to the bottom face of the shelf above. Cut and fit the divider between the shelves. Also, the upper shelves all have $^{3}/_{16}$"-wide dados for the letter dividers that fit into the bottom face of the top. Cut, fit and install the letter dividers. They sit flush with the upper gallery shelves and even with the gallery dividers at the top.

Wrap Up the Interior

All that's left inside the desk – save the drawers – are the small valances. You can make these individually, but I decided to make a block shaped to the final design, then rip each valance off using my band saw. See the simple steps in the photos below.

Fit the pieces using a shooting board and plane – the easiest and safest method here. Number the location of each valance so you can later re-install them where they are fit.

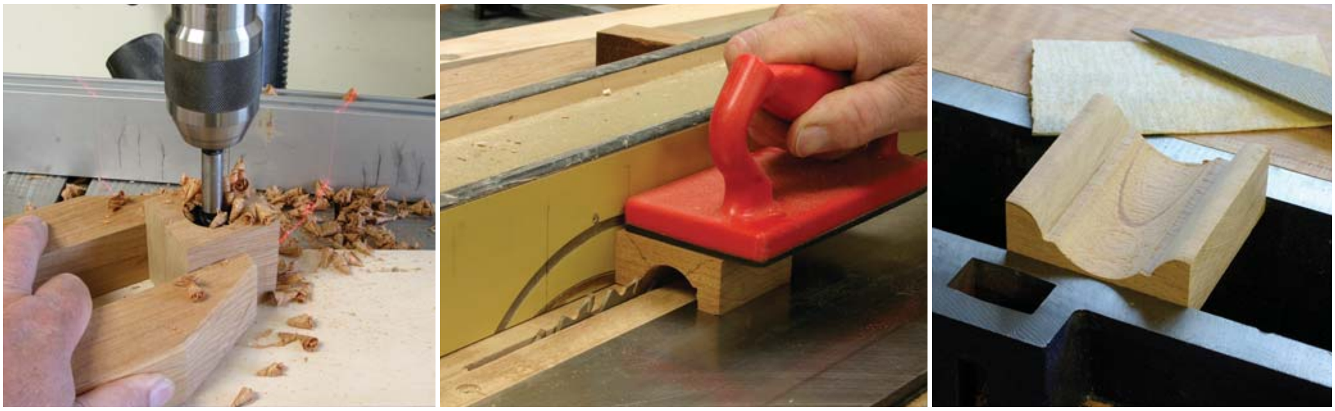
Before you can glue the valances between the letter dividers, the interior fittings need to be pulled and prepared for finish. Number the pieces as they come out. Because the desk's top doesn't need to be removed again (barring catastrophe), now is the time to glue up those full-blind dovetails. Sand all the parts, then re-install them. Because all the dividers fit tight against the backboards, I didn't glue them in.

Now, add a thin bead of glue to the valances' top edges, then slip them in place. The fit should be snug enough to hold the small pieces until the glue sets.

Mouldings, Lopers & Lid

The desk is attached to the base using shop-made wooden clips that seat in slots cut in the rails around the perimeter. I use a plate joiner set for a #20 biscuit and make two cuts to form a $^{1}/_{4}$" slot width. Make hardwood clips, then countersink and drill for #8 x 1$^{1}/_{4}$" wood screws. Place two clips at the front and back of the assembly, and one on each end. Clips hook into the slots and are screwed into the upper section's frame.

Make transition moulding that fits $^{3}/_{32}$" back from the edge of the lower section (to create a shadow line), miter the corners then attach the moulding to the upper and lower sections with brads.



All from one block. *Clamp two $^{7}/_{8}$" x 2$^{1}/_{4}$" x 2$^{1}/_{2}$"-long pieces in a handscrew and drill a centered 1$^{1}/_{4}$"-diameter hole. Set your table saw fence at $^{9}/_{16}$", raise the blade to a scant $^{3}/_{8}$" then make a pass with each edge against the fence to form the shoulders of the valance. Use a nickel to lay out the curves at the edges, then cut and shape those profiles. Band saw the block (using a push block) into thin pieces then fit them to your desk.*

For added support. *To get the most out of narrow cutoffs, rout edge profiles on alternate faces. The extra flat surface makes ripping the stock easier.*

Mill a couple loper pieces then use a tenon jig to cut a 3/8"-wide groove in one end of each. The insert is made at the table saw similar to how we made the loper dividers. Begin with a 3"-long piece of stock that's about 5" in width. Form a 1/4" rabbet on one end of the stock. Set your fence at about 1" and make a cut with your stock against the fence. Continue to adjust the fence closer to the blade until you have a tenon that fits your groove. Flip the stock over and use a push stick to cut the insert at 7/8" wide. Cut the stock into two short pieces to fit the ends of the lopers. Glue the pieces in then trim the edges flush.

To stop the lopers from pulling completely out of the desk, drill a 1/4" hole that's centered 10" back from the insert end and 1/2" down from the top edge. When the desk is finished, glue a short length of dowel in the hole. The dowel contacts the rear of the loper divider and stops the loper's travel.

The desk lid is simple to make, but takes a bit of work to fit to the desk. The width of the lid is taken from the desk sides. Measure up the slope of the desk from the point at the notch in the front to a 1/4" onto the beveled front edge of the top. The length of the lid is equal to the distance between the sides plus 5/8".

With the panel sized, profile the edges using a router and bearing-guided 3/16" roundover bit. On the back face, cut a 1/2"-deep x 3/8"-wide rabbet on the top edge and on the two ends. I do this with a two-step table saw cut. You can use a router – but if you do, be careful not to slip around the corners and rout the bottom edge as you begin and end the cut.

Lay the lid on the extended lopers and mark the hinge locations on the writing surface and the lid. Mark the hinges so the entire leaf is inlaid, leaving the knuckle free.

An extra step pays dividends. *Because end grain colors darker than face grain, cover one end of each loper with a face-grain insert made at the table saw.*

Install the hinges using a single screw in all leaves, then check the fit of the lid to the desk looking for a gap at the lid/desk side intersection. You may need to slide the leaves farther into the writing surface and/or desk lid. Make any adjustments, then install the balance of the screws.

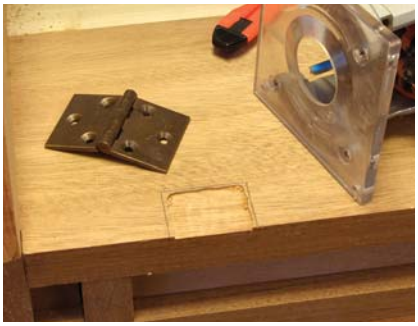
Once you have the lid fitting tight to the desk side, check the fit around the edge. If needed, adjust the fit using a shoulder plane to get it right. Finish work on the lid by installing a lock, escutcheon and catch (remove all but the escutcheon before finishing).

Drawers of the Period

The desk drawers incorporate two 18th-century construction techniques: Small drawers have an applied bottom; the larger drawers use a bottom that is slipped into grooves in the sides and front. (All the joinery is dovetails).

For each bank of drawers, keep the grain running continuously across the drawer fronts. To do this, rip stock to width, then draw an undulating pencil line along the length to keep the fronts in order as they're cut from the stock.

Edge bead made simple. *Use a router table with a straight bit to create a rabbet for the thin bead. It's especially important to use a backer when routing these edges to prevent tear-out.*

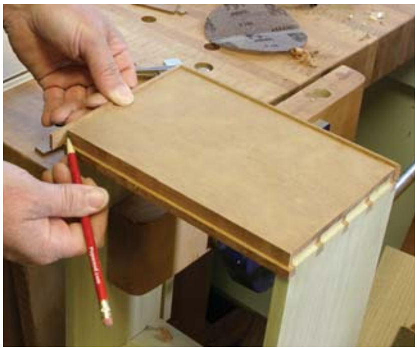


Knife the edges. *Score around the hinge layout to prevent tear-out. Use a router and small-diameter straight bit to remove the majority of the waste, then finish the shoulder cuts with a chisel then chisel out any remaining waste.*

Drawer fronts for the applied-bottom drawers have a 1/4" x 3/8" rabbet along the bottom edge – the drawer bottom is attached from below yet hides behind the drawer front. The sides and the back are cut to appropriate lengths and the widths match the fronts, less the rabbet. Join, fit and assemble the drawer boxes then cut and fit bottoms to the individual drawers. The bottoms are attached using glue at the front and pins around the perimeter.

The drawers for the base are constructed with the drawer backs 3/4" narrower than the sides and fronts. A 1/4" x 1/4" groove is cut into the front and sides. The drawer bottoms, which begin as 5/8"-thick stock, are sized to the grooves and beveled on three sides to fit those grooves. After the joinery is complete and the boxes are assembled, each front is rabbeted for an added bead detail.

Beading for the two drawer fronts is strips of 1/8"-thick x 1/2"-wide primary



Details make the difference. *Miter the corners of the beading using a bench hook and handsaw, then round the top edge with #150-grit sandpaper.*

wood. A thin bead of glue and 23-gauge pins hold the bead in place.

The Finish & Back

The upper-section back, which is two half-lapped boards, is left unfinished, as are the drawer boxes. The completed desk got a single coat of boiled linseed oil to highlight the figured grain in the desk lid and drawer fronts. (If the figure were not there, I'd skip this step.) After the oil was fully dry, I sprayed (without the drawers in place) a couple coats of blonde shellac. Also, coat the drawer fronts making sure to catch all edges. Then I sanded the entire piece with #400-grit sandpaper.

To warm the finish, I slipped the drawers into the desk then applied a few coats of orange shellac, sanding after each coat. After a few more coats of blonde shellac, I had a nice build and had filled and leveled much of the grain. After a final #400-grit sanding, I applied two layers of pre-catalyzed lacquer. Then I installed all hardware, nailed the back in place and moved the desk out of the shop.

As I again opened the file on our papers from MESDA and reread the information on this desk, I discovered that the term "Lady's Desk" is what these small desks were called by Hepplewhite and Sheraton. However, desks of this size were used by both men and women, and were generally placed in the bedroom. That tells me these desks were built for families of means. I'm not "of means" enough to put this in my bedroom, but I'll surely find a place of honor in my home. **PWM**

This Lady's Desk is among the 27 pieces featured in our new book of measured shop drawings, "Furniture in the Southern Style," (Popular Woodworking Books). Glen can be reached at glen.d.huey@gmail.com.

Southern Lady's Desk

	NO.	ITEM	DIMENSIONS (INCHES)			MATERIAL	COMMENTS
			T	W	L		
BASE UNIT							
☐	4	Legs	1 1/2	1 1/2	25 1/2	Mahogany	
☐	2	Sides	7/8	8	14	Mahogany	1" TBE*
☐	1	Back	7/8	8	21	Mahogany	1" TBE
☐	2	Front rails	7/8	1	21	Mahogany	1" TBE
☐	1	Drawer divider	7/8	7/8	7	Mahogany	1/2" TBE
☐	1	Center runner	7/8	2 1/8	14 5/8	Poplar	1/2" TOE, 7/8" TOE**
☐	2	Outer runners	5/8	1 1/4	13 1/4	Poplar	Notched ends
☐	1	Center guide	7/8	5/8	11 3/4	Poplar	
☐	2	Outer guides	5/8	5/8	11 3/4	Poplar	
DESK UNIT							
☐	2	Sides	7/8	15	12 3/8	Mahogany	
☐	1	Top	7/8	9	21	Mahogany	
☐	1	Lid	3/4	11	20	Mahogany	
☐	1	Writing surface	7/8	13 7/8	19 3/4	Mahogany/Poplar	
☐	1	Rail	7/8	7/8	19 1/4	Mahogany	
☐	2	Loper dividers	7/8	7/8	2 1/4	Mahogany	1/2" TBE
☐	2	Frames	7/8	2	20 1/4	Poplar	
☐	2	Frame rails	7/8	2 3/8	10 1/2	Poplar	1/2" TOE, 1" TOE
☐	2	Lopers	7/8	1 1/4	13 3/8	Mahogany	
☐	1	Loper insert	7/8	1 1/4	5	Mahogany	Make two inserts
☐	2	Loper guides	7/8	5/8	12 1/2	Poplar	
☐	1	Back	1/2	11 7/8	20 1/4	Poplar	2 shiplapped pieces
GALLERY PARTS							
☐	1	Base	1/2	11 5/8	19 1/4	Mahogany/Poplar	
☐	2	Dividers	3/8	11 1/4	8 7/8	Mahogany	
☐	1	Lower shelf – center	1/4	10 1/4	9 5/8	Mahogany/Poplar	
☐	2	Lower shelves – outer	1/4	10 1/4	4 13/16	Mahogany/Poplar	
☐	1	Upper shelf – center	1/4	7 3/8	9 5/8	Mahogany	
☐	2	Upper shelf – outer	1/4	7 3/8	4 13/16	Mahogany	
☐	5	Letter dividers	3/16	7 3/8	4 3/8	Mahogany	
☐	8	Valances	1/4	7/8	2 1/4	Mahogany	
☐	1	Center drawer divider	1/4	7 3/4	1 3/4	Mahogany	
DRAWER FRONTS †							
☐	4	Gallery – top	3/4	1 5/8	4 9/16	Mahogany	
☐	2	Gallery – bottom outer	3/4	1 7/8	4 9/16	Mahogany	
☐	1	Gallery – bottom center	3/4	1 7/8	9 3/8	Mahogany	
☐	2	Base	3/4	6	9 1/16	Mahogany	

* Tenon both ends; ** Tenon one end; † Drawer part sizes taken from fronts. Gallery drawer parts are 3/8" thick except for applied bottoms. Base drawer parts are 1/2" thick, except bottoms at 5/8".

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1	▸ desk lock, #LK-20
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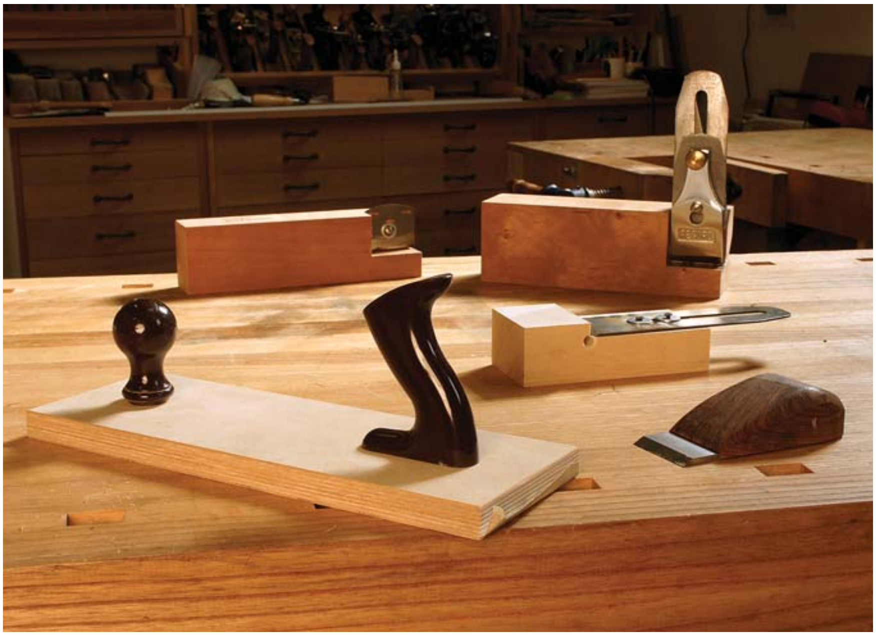
New Uses for Old Handplanes

BY JEFF MILLER

Frogs, irons and handles can be repurposed into clever shop-made tools.



New tools from old. *Don't let those old planes just sit and gather dust – the parts can be used to make some clever new tools (clockwise from left): a sanding block, a simple string inlay thicknesser, an adjustable string inlay thicknesser, a dowel-making jig and a chisel plane.*

The box arrives in the mail and the new plane you've been yearning for has finally arrived. You spend a few minutes admiring the workmanship, then get to work flattening the back of the plane iron and honing a razor sharp edge. You take a few whisper-thin shavings and feel contentment.

Later comes the unsettling question: What do you do with your old handplane – the one that never quite cut the way you wanted it to? Or what about that just "plain awful" plane you picked up at a garage sale or on eBay, or the one that fell off a bench and broke? I've had quite a few planes over the years that fell into each of these categories, and rather than toss them or sell them off I've been able to make very productive use of many of the parts.

What kinds of planes? And what is actually useful? Almost everything has some part or other that can be repurposed (well, maybe not the stamped sheet metal block plane a friend once gave me). But whether you salvage the handles, the blade or other parts, there's almost always something that can be put to good use.

Repurpose the Knob & Tote

The easiest parts to reuse are the handles. The knob can work as the handle for a shop-made router sub-base with an offset handle. This is particularly useful for edging tabletops, especially with larger router bits.

You can also glue some thin rubber to the bottom of a knob and use it as a handle to help increase the pressure on a plane iron when lapping the back flat (if your knob is hollow, you may have to plug the hole). The tote and the knob can be used to make up a simple "sanding plane" – a large sanding block. The handles make it much easier to use than a plain block.

Sanding block. *Attach the knob and tote to a piece of plywood and you have an instant sanding block (attach sticky-back sandpaper on the bottom of the plywood before use).*

Put the Blade Back to Work

One of the most useful parts of a decommissioned plane is, of course, the blade. In many cases, blades are interchangeable between planes, and you can just sharpen your old one up and keep it handy so you don't have to stop to sharpen while you're working; you can just switch blades. An extra blade for a block plane could be ground to a steeper angle, effectively raising the cutting angle and allowing you to cut more difficult grain with less tear-out.

You can't do exactly the same thing for a bench plane, but you can add a back bevel to create a steeper cutting angle. You may also want to sharpen an extra blade with a crowned edge, giving you the option of working with or without a crown without re-grinding your main blade.

Unfortunately, upgrading to one of the newer and better planes on the market may completely rule out all of these "extra blade" options. Most of the blades on these planes are significantly thicker, and an old iron won't work. Picking up

PHOTOS & ILLUSTRATIONS BY THE AUTHOR

an extra plane iron or two for any of these reasons makes sense anyhow.

There are many other options for a blade, however. A little bit of work using a router or a chisel and a router plane to make a blade recess can transform a small block of wood into a blade handle, essentially creating a chisel plane – great for cleaning glue out of corners or for paring things flush. To keep the blade fixed in place, screw a pair of magnet cups for 3/8" rare earth magnets into the blade recess in the handle. Pop the magnets in and snap the blade into place. You'll be surprised how well this holds. In fact, to remove the blade safely, you'll have to hold it tight against the bench and pull the handle off.

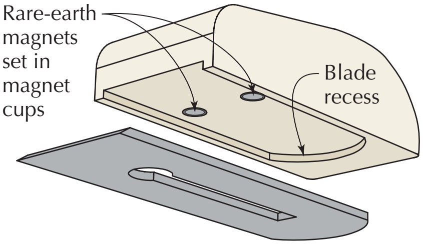
Make a Tool for Making Dowels

It's a little trickier, but you can also use the blade (or a spokeshave blade) to create a dowel-making tool, with which you can create your own custom dowels, 1/4" in diameter and larger.

Chisel plane. *Rare earth magnets hold the blade tight to the handle in this chisel plane.*

First, the edge of the blade needs to be ground and sharpened in a curve with a radius of roughly 12" to 13".

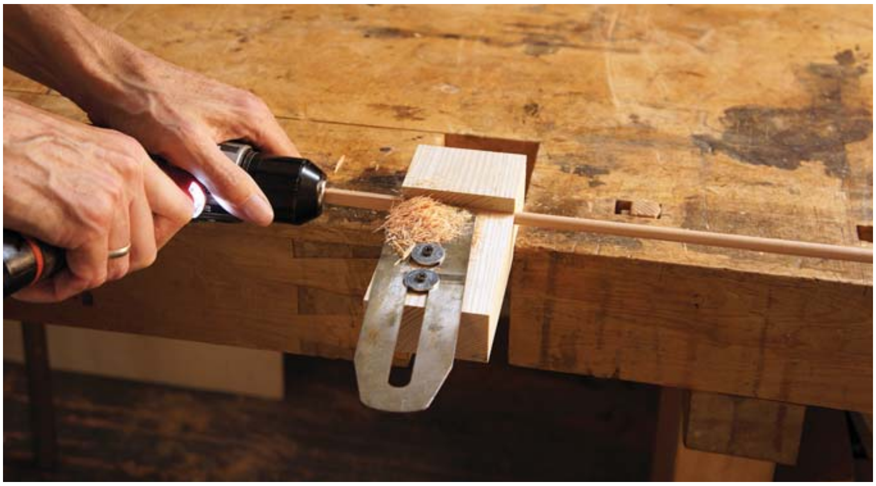
Next, make the body of the dowel-cutting jig. Start with a 1 3/4" x 2 3/4" x 6" block of wood, and drill a hole the same size as the diameter of the dowel you need.



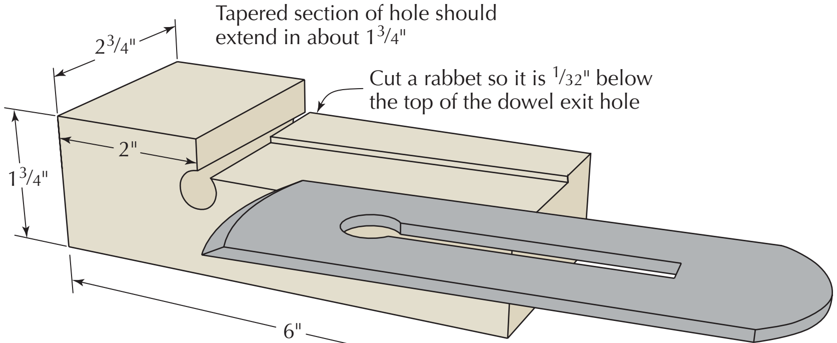
CHISEL PLANE
3D VIEW

Now you need to enlarge one side of this hole so you can insert a square blank (see "Dowel Chart" below). Ideally, this entry hole should taper down to the finished hole size (a taper reamer will do this easily – Lee Valley sells one that's just about right), but you can certainly make do with a series of incrementally larger holes creating a stepped taper. I just used drill bits 1/64" larger for each step in the taper.

Cut a large rabbet into the body of the jig, sneaking up on the proper depth, which is 1/32" below the top of the dowel-sized hole. This rabbet will naturally cut into more of the tapered part as well. Now you just have to screw the plane blade down onto this rabbet, bevel-side up, so that the curve extends into the tapered section just a little, and the blade stops cutting once the dowel reaches the



Custom dowels. *With this jig, you can make your own dowels – and you can customize the jig to fit your dowel-diameter needs.*


Tapered section of hole should extend in about 1 3/4"
2 3/4"
Cut a rabbet so it is 1/32" below the top of the dowel exit hole
2"
1 3/4"
6"

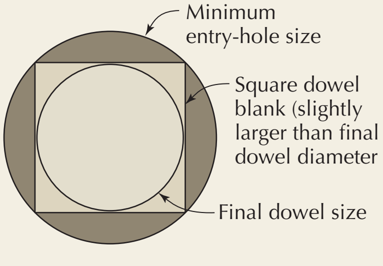
DOWEL-MAKING TOOL
3D VIEW

Dowel Chart

DOWEL SIZE	MINIMUM ENTRY-HOLE SIZE
1/4"	13/32"
5/16"	1/2"
3/8"	19/32"
1/2"	3/4"

You can also calculate the entry hole size with the following formula:

$$\sqrt{(\text{Dowel size} + 1/32)^{2} \times 2}$$


Minimum entry-hole size
Square dowel blank (slightly larger than final dowel diameter
Final dowel size

correct diameter. This will take a little bit of fooling around – but not that much once you see how it works.

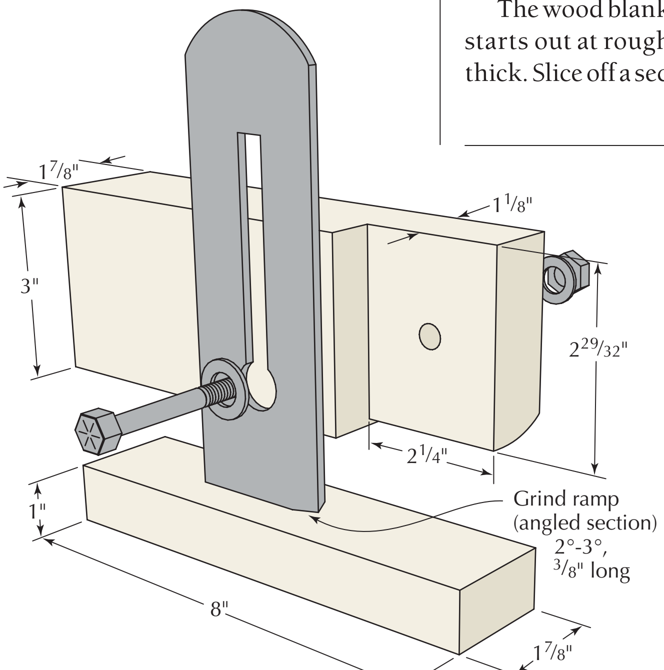
The best way to cut the dowels is to push a rotating blank through the jig with a drill. I have done two things to chuck up the dowel. You can roughly shave down an inch or so at the end of a square dowel blank to more-or-less round then simply chuck it up directly in the drill. If you are planning to make a lot of dowels, your best bet is to get a square socket for a socket wrench of the appropriate size, and drive that onto the end of the square blank, then attach that to your drill with an adapter.

Two Inlay Stringing Thicknessers

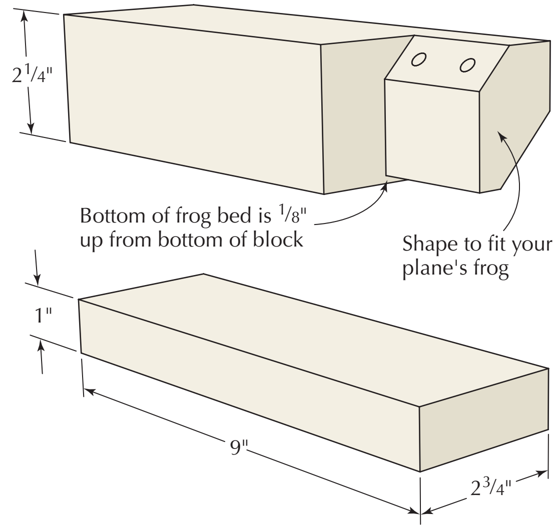
It's a little bit simpler to make an inlay stringing thicknesser out of an old plane or spokeshave blade. Start by regrinding the edge to a 45° bevel and hone it to a sharp edge. You'll also need to grind then hone an angled section on the side of the blade, which will allow you to progressively shave the slightly thicker stringing stock down to the exact thickness needed for the inlay grooves.

The wood blank for the thicknesser starts out at roughly 4⅛" x 8" x 1⅞" thick. Slice off a section that is 1" thick, and set it aside for now. The rest of the blank now needs to be shaped to hold the blade in position and to allow for clearance for the stringing. This can be done on the table saw, holding the blank in a tenoning jig. Then bevel or round over the back edge to make it easier to pull the stringing through without breaking it. Now glue the bottom slice back on. Hold the plane iron in place and mark for a bolt hole (or two) to attach it to the jig. Set the location of the plane iron using a feeler gauge to set up the distance you need from the bottom of the opening.

To use the thicknesser, clamp it in a vise and pull your stringing through, starting out at the angled edge of the

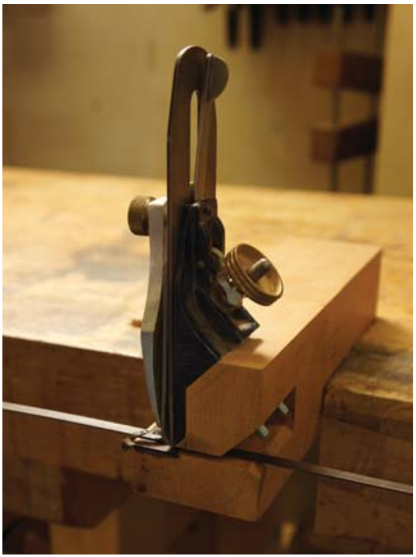


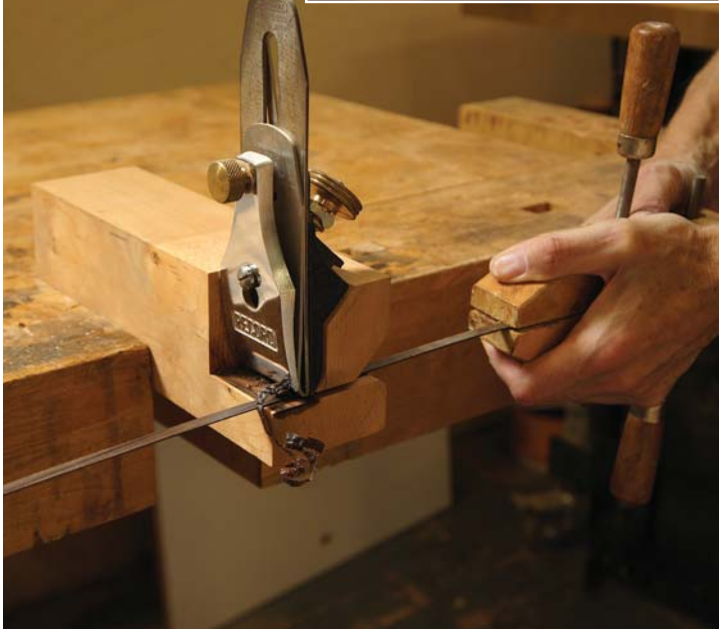
SIMPLE INLAY THICKNESSER
EXPLODED VIEW



ADJUSTABLE INLAY THICKNESSER
EXPLODED VIEW

Adjustable inlay thicknesser. *While the simple inlay thicknesser at left is a snap to build, it cuts only one stock thickness. A little more work, and you can build a tool that incorporates a frog to allow you to adjust the iron for more versatility. At right is what the adjustable inlay thicknesser looks like from behind; below is how I use it.*





> *"The purpose – where I start – is the idea of use. It is not recycling, it's reuse."*
>
> — Issey Miyake (1938 -)
> Japanese fashion designer

blade and working your way in until you're able to pull the stringing through on the flat section of the blade. I'll often use a small clamp on the end of the piece of stringing to give me a better grip on the thin wood.

A more complex, but much more versatile (and adjustable) inlay stringing thicknesser makes use of the complete frog assembly, including the blade and chipbreaker. The basic method is the same as the simpler version, but here, you're mounting the frog on the jig instead of just the blade. This gives you the ability to adjust the thickness, or to start out with stock that is less precisely milled. It also gives you flexibility to adjust the angle of the blade, although straight is usually best.

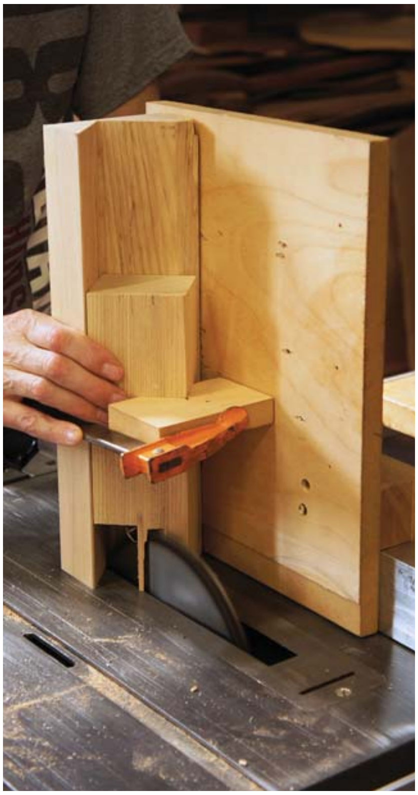


Table saw safety. *A tenon jig and V-blocks keep you safe at the table saw as you make the cuts for the adjustable inlay thicknesser.*

You'll still need to start by re-grinding the bevel of the blade, and adding the "ramp" – the angled section on the outer side of the blade. Working with the jig blank (3⅜" x 9" x 2¾") is similar to making the simpler thicknesser: Slice off the bottom inch, then shape the bed for the frog on one end to match your plane's frog. I did that work upright on the table saw with my tenoning jig, using a V-block (two 45° rip cuts in a board to create a 90° notch down the center of the block) to hold the jig blank for the 45 °cuts.

Once all of the cuts are made, hold the frog (without the blade) in place and mark for the mounting holes, which are centered in the bolt slots in the frog. Drill the ¼" holes straight through the angled section. I used square nuts with the bolts, and recessed them into the back of the block – but that's purely for aesthetics; they don't have to be recessed. I pushed the ¼" bolts through the holes, threaded on the nuts, then scribed around them with a marking knife, and chiseled the recesses for the nuts.

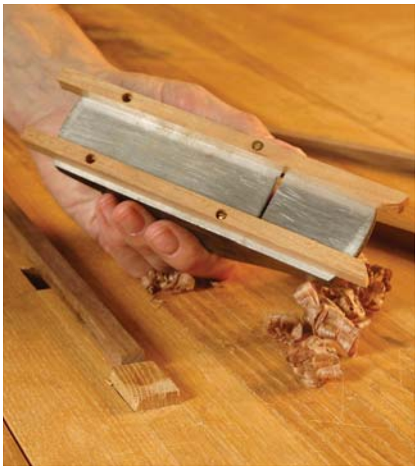
Finally, bolt the frog into place, install the blade, chipbreaker and cap iron, then adjust the blade as needed. You may find that you have to grind back the leading edge of the chipbreaker to get the blade into position and adjusted properly.

No-scrap Reuse

Not interested in scrapping your plane? You can still add a very useful feature to an intact plane – but it's an operation you probably wouldn't want to perform on one of your favorites.

This modification involves drilling and tapping four small holes that can accept 4-40 bolts. You can then attach reference strips to the bottom of your plane. This is the easiest way to plane strips that are perfectly flat and exactly to thickness. I've used this method for making perfect half-lap joints, gridwork for door muntins, and lattice work. The reference strips in these cases are sized to plane your stock down to a thickness that fits exactly into the notches. But precise stock of any width up to what will fit between the reference strips can be made this way.

It can be helpful to set up a plane with a higher cutting angle for this kind of work so you have less trouble with grain direction. On the block plane I used, I ground a 45° bevel. You could add a back bevel to a bench plane to get the same effect. Be sure to do your planing on a flat bench. I usually plane against a single bench dog; clamping between dogs can sometimes spring the piece you're planing, and you also need the entire length of the stock solidly on your bench and not spanning the typical opening created by the tail vise.



Perfect strips. *Attach reference strips to a block plane to produce precise stock.*

Is there a leftover or damaged plane body in your collection? Not much hope for that. The best bet might be a door stop. Using it as a fishing sinker might work, too. **PWM**

Jeff is a Chicago-based furniture maker and woodworking teacher. He's currently working on a new book covering the essentials of craftsmanship, due out next fall from Popular Woodworking Books.

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The 'Impossitails' Zone

BY ROY UNDERHILL

Amaze your friends with quadrilateral and rising dovetails.

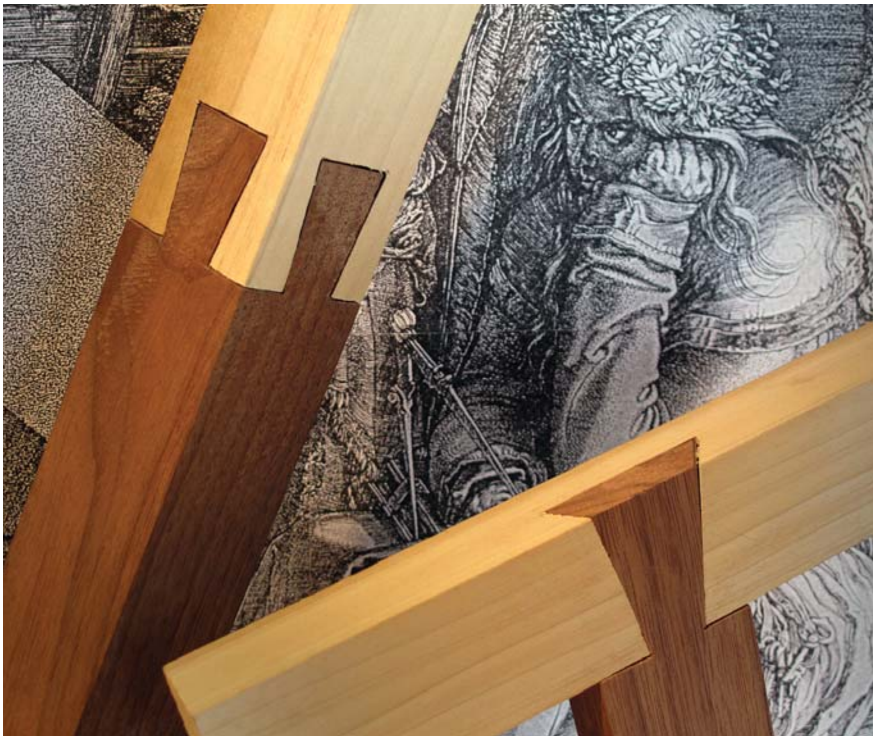
An ordinary day in the shop, but suddenly, you're dovetailing through another dimension, a dimension not only of sight and sound, but of mind. You're on a journey into a woodworking land whose boundaries are that of imagination. That's the signpost up ahead, your next stop … The "Impossitails" Zone!

In the ordinary world, we accept the limitations of dovetails. They're strong in most directions, but no matter how tight you cut them, they always have one plane of weakness – they can pull apart in the same direction that they were put together. That's why, starting in the times of Dante and de Sade, certain deviant minds of woodworking began the quest for dovetails that interlock for eternity, configured so that the joint confronts solid wood in every direction. The dovetails they created can never come apart. Problem is, they can also never go together.

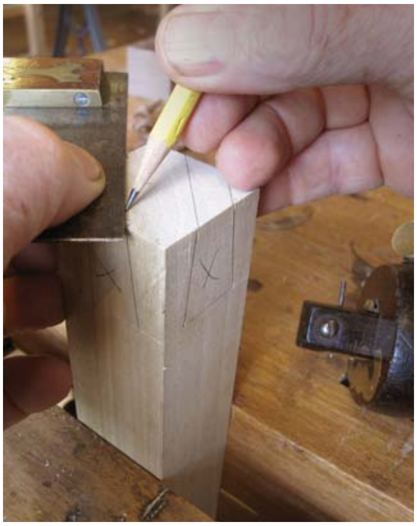
Or so it seems. Welcome to the world of impossitails – joints that exploit our tendency to think at right angles to create the illusion of impossibility. We'll look at two of these joints, the quadratail and the rising dovetail – unlocking their secrets with the key of imagination.

The 'Quadratail'

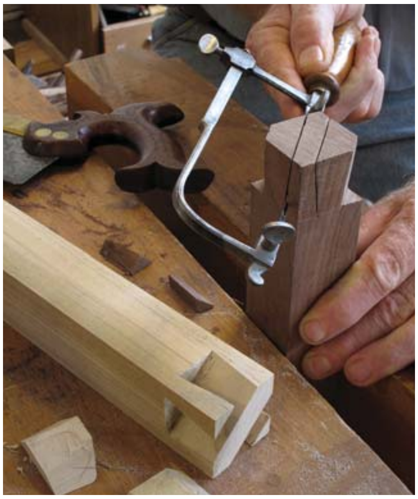
… is a sliding dovetail scarf joint that connects two lengths of square stock with dovetails showing on all four faces. Now, a dovetail emerging on two opposing faces would make sense; you could



Is it magic? *Until their secrets are revealed, the mysteries of the "quadratail" and "rising dovetail" are enough to make anyone melancholy!"*



Quadratail layout. *Start with two pieces of contrasting stock, truly square and equally thick all about. Mark the length of the dovetails (perhaps three-quarters of the thickness) around the ends of both pieces with a marking gauge fenced against the end grain. Lay out dovetails on each face, ensuring that they are identical by working your way around with a marking gauge, coming in from both edges to mark the wide ends of the dovetails. Then reset the gauge to mark all the narrow ends.*



Quadratail cuts. *Scribe the diagonal lines connecting adjacent dovetails across the end grain of both pieces. Mark the waste pieces accordingly and saw the cheeks of the tails and sockets. A fine saw running right down the layout lines should give you the right amount of clearance. You can easily saw the shoulders off the outside of the dovetailed piece, but the space between them and in the sockets on the other piece will need roughing in with a coping saw. Finish the end grain with your sharpest chisel.*

PHOTOS BY THE AUTHOR

just slide them together. But four? Our mind connects the dovetails through the joint at right angles to the four surfaces, forming a mental interior in the shape of a plus sign – impossible to slide together, but there it is!

The trick is that the dovetails connect obliquely through adjacent corners rather than directly across. Because the diagonal paths of the two sliding dovetails are parallel, the joint easily slides together and apart, but only at 45° to the faces.

Creating the illusion calls for precise saw and chisel work, but it's easy enough. Simply draw equal dovetails on all four faces then saw and chisel them out on the diagonal. One becomes the positive and the other negative space – one the dovetail and one the socket.

The Rising Dovetail

… is even more irritating, and far easier to cut than to explain. Here, you create the dovetail illusion by exposing an oblique slice of a triangular prism. It's called the rising dovetail because the tenon slides upward in the mortise to fill the exposed dovetail-shaped space.

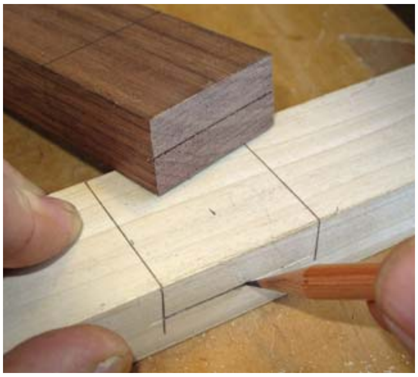
This is the trick behind the notorious puzzle mallets from the turn of the last century (and an article you'll see in an upcoming issue of *Popular Woodworking Magazine*). This is not a particularly strong joint when used in equally-sized stock. The only place I have seen the rising dovetail used in furniture is in the teacher's lectern in a little schoolhouse at a Colonial Virginia plantation.

> *"It's kind of fun to do the impossible."*
>
> — Walt Disney (1901 - 1966)
> American film icon

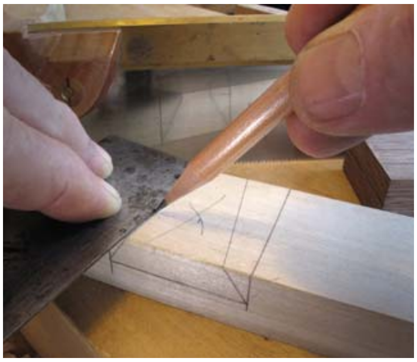
The T-shaped foot of the lectern that faces the students was joined with a rising dovetail, posing a perpetual question and the lesson that things are not always as we suppose them to be!

Some of the old books advise you to glue these impossitails together "so that the secret may not be discovered." I'd leave them loose so that others can enjoy the mystery. It just depends upon how irksome you want to be. **PWM**

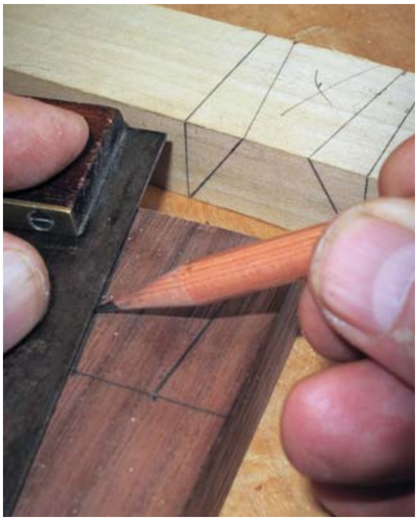
Roy is the host of "The Woodwright's Shop," the longest-running woodworking show on television (now in its 31st season on PBS).



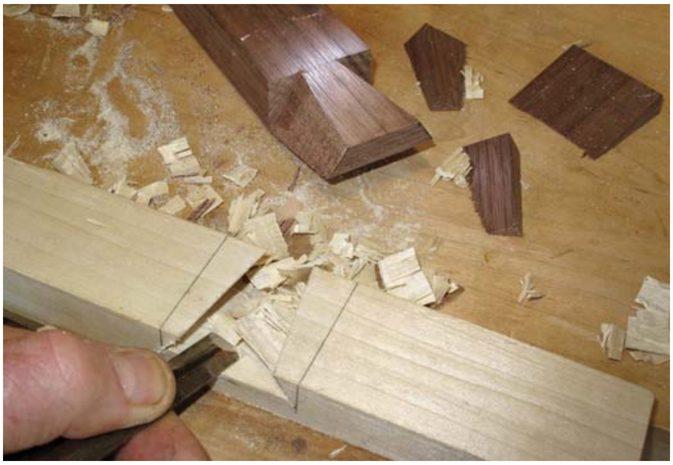
Gauge the rising dovetail. *Superimpose the two pieces just as they would intersect if pushed squarely together into a T. Lay out the width of each piece on the other and bring the lines all around. Starting on the piece that you will tenon, gauge down half of the thickness on the end grain. Mark that end, then, with the same setting, mark along the far side of the piece to be mortised.*



Convergent lines. *Set your bevel gauge to a bold angle and draw two sets of convergent lines on the edges of the piece to be mortised – two lines beginning at the ends of the "half-of-the-thickness" line and two lines on the opposite edge beginning at the bottom. Connect the ends of these lines across the face (above) and you've defined the mortise. (You can see the layout of the backside of the mortise reflected in the face of the dovetail saw.)*



Transfer marks. *Set this piece edgewise on the face of the tenon and transfer the dimensions. Connect the dots and you have defined the dovetail tenon.*



Cheeks and shoulders. *Saw the cheeks and shoulders of the dovetail tenon. Cut the mortise by making three saw cuts, two down the sides and one down the middle then chisel out the waste. Trim as necessary and slide them together.*

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Tommy Mac & 'Rough Cut'

BY GLEN D. HUEY

As 'Rough Cut' begins season two, we discover the host's career path to television success.

North Bennet talent. *Tommy joins North Bennet Street School instructors Lance Patterson and Steve Brown, who are preparing to scrutinize a bombé drawer.*

I'm a firm believer that every person has a talent; everyone is great at something. To find that something and make it your life's work is how you stand out from others. And that leads to success – be it money, fame or happiness.

Step one of that discovery is to recognize what your life's calling is when it passes in front of you, and to be able to see yourself in that position. With that, you need the discipline to stay on course while rising above naysayers, and you have to take advantage of any opportunity that comes your way. Of course, it also helps to have a little luck.

Thomas MacDonald, host of "Rough Cut: Woodworking with Tommy Mac" – the newest woodworking show from WGBH, Boston's public television station – perfectly fits this description. He's a "go-getter" woodworker who found his calling as he progressed through the woodworking program at North Bennet Street School (NBSS) in Boston.

As he did so, Tommy accepted advice that led him in the right direction, he was aggressive enough to make things happen as he took advantage of opportunities, and he had the discipline to stay the course – even when others doubted his ability. He had a bit of luck, too.

At the Beginning

If you've read anything about Tommy, you surely have read that he was injured while working construction on Boston's massive "Big Dig" project. But the real story of his path to hosting an Emmy-nominated woodworking show, which opens its second season in October 2011, begins much later.

Tommy reached a settlement for his construction misfortune then began renovating a house near his parent's home. He soon discovered that wasn't his calling, so he continued his search – but he knew he wanted to stay in construction, or to work with wood in some way. As his funds dwindled, Tommy turned to NBSS. "I went to North Bennet out of desperation," he said. That turned out to be a great decision.

> *"I find that the harder I work, the more luck I seem to have."*
>
> — St. John Honeywood (1763 - 1798)
> poet, attorney

Once at North Bennet, things began to take shape. On a walk through of the school, Tommy, a personable fellow, struck up a conversation with an older gentleman – Jock Gifford. You may not know the name Jock Gifford, but you probably know his work. Gifford is, said Tommy, a gifted artisan. He is a furniture maker, an accomplished jewelry artist and, to most woodworkers, he's best-known as the architect of Norm Abram's old digs at "The New Yankee Workshop" and for his numerous appearances on "This Old House" (shows that are both produced by WGBH). During their time at NBSS, Gifford and Tommy became friends.

False Start

As Tommy advanced through the NBSS program, he made regular trips to a jobs posting board at the school to find woodworking opportunities for pay. He completed some repairs for a

LEAD PHOTO BY JOCK GIFFORD; UPPER LEFT, NEXT PAGE BY JOHN GILLOOLY/PEI;
LOWER LEFT, NEXT PAGE COURTESY OF NORTH BENNET STREET SCHOOL; REMAINDER OF PHOTOS BY THE AUTHOR

couple who then asked about commissioned work. The clients wanted a nice highboy built for their home. Tommy met his clients at a museum, walked with them to discuss different pieces on display, then worked out the details for the commissioned piece.

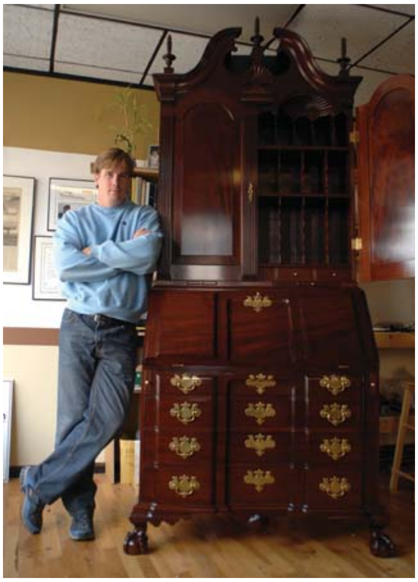
Needless to say, Tommy was pumped. Back at NBSS, he was walking on air; he could now call himself a professional furniture maker. But a couple weeks later, a call came to cancel the commission. His clients backed out of the deal. Though it was a blow, Tommy pushed on and stayed focused on woodworking.

Then the school's instructors came to him with a challenge. They handed Tommy a photograph and suggested that he set his sights beyond a highboy and build a Salem block-front secretary – they wanted Tommy to move beyond his comfort zone.

A Real Opportunity

It was that secretary that caught the eye of Bob Vila while he was at NBSS to record a segment on the school for his television show. In fact, Vila was so impressed with the work of the NBSS student that he kept a close eye on Tommy.

Someone from Vila's camp handed Tommy a camera and suggested that he film his work in the shop and then post it online. The camera loved Tommy, and Tommy was more than comfortable with the camera – this was his first real taste of what would become his life's calling.



Challenge piece. *This Salem secretary was the piece that started Tommy down the home-stretch to hosting a woodworking show. Bob Vila was captivated by the secretary and made it a point to remember Tommy.*

Later, Vila extended an invitation to all students to bring their finished furniture work to fill the rooms of the home at which he was filming. Tommy hustled to get as many pieces as he could – 11 in all – and that can-do attitude gave him a taste of fame. As Vila strolled through the home filming the segment, Tommy was mentioned often as his many furniture pieces were shown on camera.

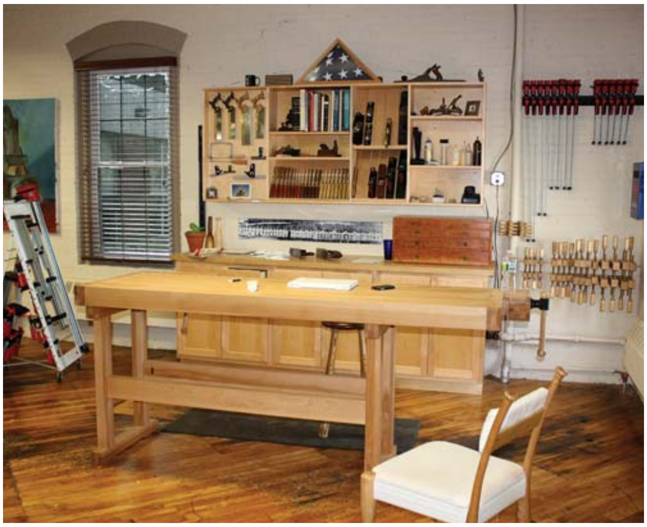
Friends working together. *Rough Cut director Laurie Donnelly not only guides the show, she is a calming influence on Tommy.*

More Connections

Upon completing his program at NBSS, Tommy decided to stay around for another term. That also proved to be a great decision. The incoming class just so happened to include a recently retired WGBH executive. Information was passed on, introductions were made and Tommy met Laurie Donnelly, executive producer of lifestyle programming for WGBH.

With his North Bennet certification achieved, Tommy began conversations with Eli Cleveland, a new student at NBSS and the guy destined to become Tommy's right-hand man. Cleveland was a regular contributor of comments on Tommy's blog, and Tommy asked him to stop by the shop to talk more and to possibly work together on a project. The two hit it off and continued to work

Challenge accepted. *Inside the workshop at North Bennet, Tommy works diligently on his Salem secretary base in this NBSS archive photo.*



As seen on TV. *Tommy's workbench is in the front left-hand corner of his shop. Nearly each show begins at or around this bench.*

in the shop while posting online and building a following. (Read more about Cleveland in "From College Student to Technical Advisor" below.)

As Tommy's woodworking advanced, he made it a point to keep Donnelly in the loop and updated with anything new in his career with the occasional e-mail to keep his name fresh in her mind. When the time came to consider a new woodworking show (after Norm Abram announced his retirement) – Donnelly immediately thought of Tommy.

Single-mindedness

WGBH, Donnelly and Tommy worked out the details and an announcement was made about the new show in February 2010. Meanwhile, WGBH was searching for a show sponsor.

So Tommy picked up the phone and placed a call to Jeff Forbes, president of Woodcraft Supply. Tommy said he began the conversation with: "If someone would have come along 21 years ago and said Norm (Abram) was going to do a show, would you want in? What would you say?"

On St. Patrick's day in 2010, Tommy learned that Woodcraft Supply would sponsor the show. "It was the greatest day for an Irish guy," Tommy said.

Tommy's right hand. *Eli Cleveland earned the position of technical adviser for season two of the show. He's part of the glue that binds the show.*

Year One vs. Year Two Differences

The short time span is amazing when you begin to analyze "Rough Cut: Woodworking with Tommy Mac." Woodcraft Supply agreed to sponsor the show in March 2010. The first show aired in October 2010. That was but six months in which to build the projects, and film and edit to produce 13 episodes. Needless to say, the entire crew was rushed. There was no "getting up to speed." They just did it. It was all learn-as-you-go. Hours of film were captured making the editor's job difficult – a reflection of the show's name: Rough Cut.

From College Student to Technical Adviser

Eli Cleveland is not your "run of the mill" woodworker. He was a Georgia college student close to graduation when he and some friends decided to turn the second bedroom in his apartment into a small workshop. When not involved in classes to become an actuary, Cleveland would develop project ideas, then he and his friends would move into the shop to work things out.

He quickly discovered that he enjoyed shop time more than class time. This was an area that needed further research. As he scoured the Internet looking for opportunities, a place in Boston kept coming up: the North Bennet Street School (NBSS). The school had summer workshops, so Cleveland decided to attend and try his hand at woodworking. In 2007, he moved to Boston and enrolled.

After his summer workshop was over, Cleveland decided to stay on at NBSS. He enrolled in the two-year Cabinet and Furniture Making program.

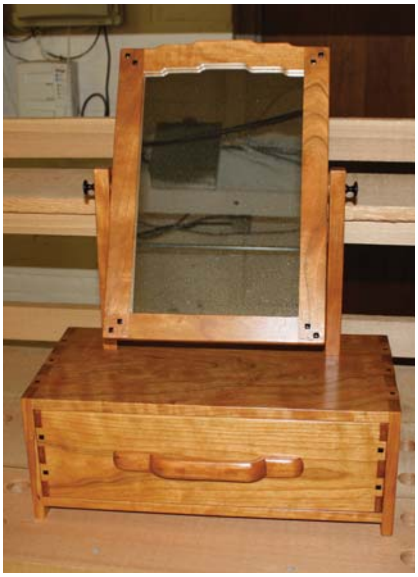
One day, Tommy MacDonald came into the school and announced that he had an online woodworking blog that students should check out. Cleveland stopped by the site for a look. He found himself there often, regularly left comments on MacDonald's posts and participated in the blog's forum. The NBSS alum and NBSS student developed a camaraderie and soon found themselves working together in MacDonald's shop. Cleveland enjoyed the work so much that he did it for two years without pay, during which he completed his NBSS program.

When "Rough Cut: Woodworking with Tommy Mac" was announced, MacDonald asked Cleveland to be a part of it. In year one, Cleveland worked on projects and did SketchUp drawings of the pieces. For the second season, he is the technical adviser for the show.

Cleveland enjoys life in Boston's North End without a vehicle, and rides the train out to MacDonald's shop. Each day, that's a 50-minute commute north of his home to get to work. Now that's dedication.

— GH

The sidekick. *Cleveland is the quiet woodworker who gets everything ready for the next shot and occasionally works in front of the camera. It's the perfect position for this "Rough Cut: Woodworking with Tommy Mac" technical adviser.*



Projects and trips. *Season two has Tommy all over the country for road trips and project selection. This Greene & Greene-inspired dressing mirror is the subject of the first show.*

Ready to film. *Tommy waits for "Action!" while sitting at his mortise machine. He gravitates toward using hand tools – but knows when power tools are the better choice.*

Jack of all trades. *Tommy is not just the show's host. He pitches in wherever needed.*

When I asked Tommy what was going to be different about this year's show, he quickly responded that for season two, the team had time to plan the shows and projects – and better planning means less unused footage in the editor's junk folder. Filming of the shop portion of the show for the 2011 season was scheduled for two days per week – usually one day early in the week and one day toward the end of the week so that Tommy, Cleveland and the crew had time to better prepare. As a result of more planning, season two shows will be much smoother and less hectic, Tommy said.

The "Rough Cut Road-trip" feature from season one continues in season two, but it's been shortened to allow more time for the project build. And this year, Tommy doesn't travel solely around the Boston area. The 2011 shows take us out to California for a visit to the Gamble House in Pasadena and a stop at the shop of legendary woodworker Sam Maloof. There are also a couple trips to New York as well as a few around Beantown.

Another difference is that Tommy had more of a hand in project selection for season two. Because of this, you'll see projects not only out of wood, but of other materials including metal and marble. You'll learn techniques such as sand-shading and bent lamination. There are Greene & Greene-inspired projects and other Arts & Crafts work, as well as furniture in other period and contemporary styles.

You'll also see more interaction with guests. While I was on the Rough Cut set for a photo shoot, frequent *Popular Woodworking Magazine* contributor Chuck Bender was the guest for the episode, on which he and Tommy worked together to build an Arts & Crafts-inspired Morris chair. In season two, along with many guests, you'll also see the regulars from season one – Cleveland, Steve Brown and Al D'Attanasio.

While "Rough Cut: Woodworking with Tommy Mac" imparts valuable woodworking information, I think the most important lesson Tommy's experience can teach is that to succeed, you have to be willing to work hard and take advantage of every opportunity – and a little luck never hurts. **PWM**

Glen can be reached at glen.d.huey@gmail.com.

A gracious host. *Tommy keeps the show moving along – and in season two, a few production tweaks allow guests more time to share their expertise. In this picture, Tommy is working with professional woodworker (and frequent* Popular Woodworking Magazine *contributor) Chuck Bender.*

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VIDEO: *Learn about season two shows as Tommy wrestles his make-up artist.*

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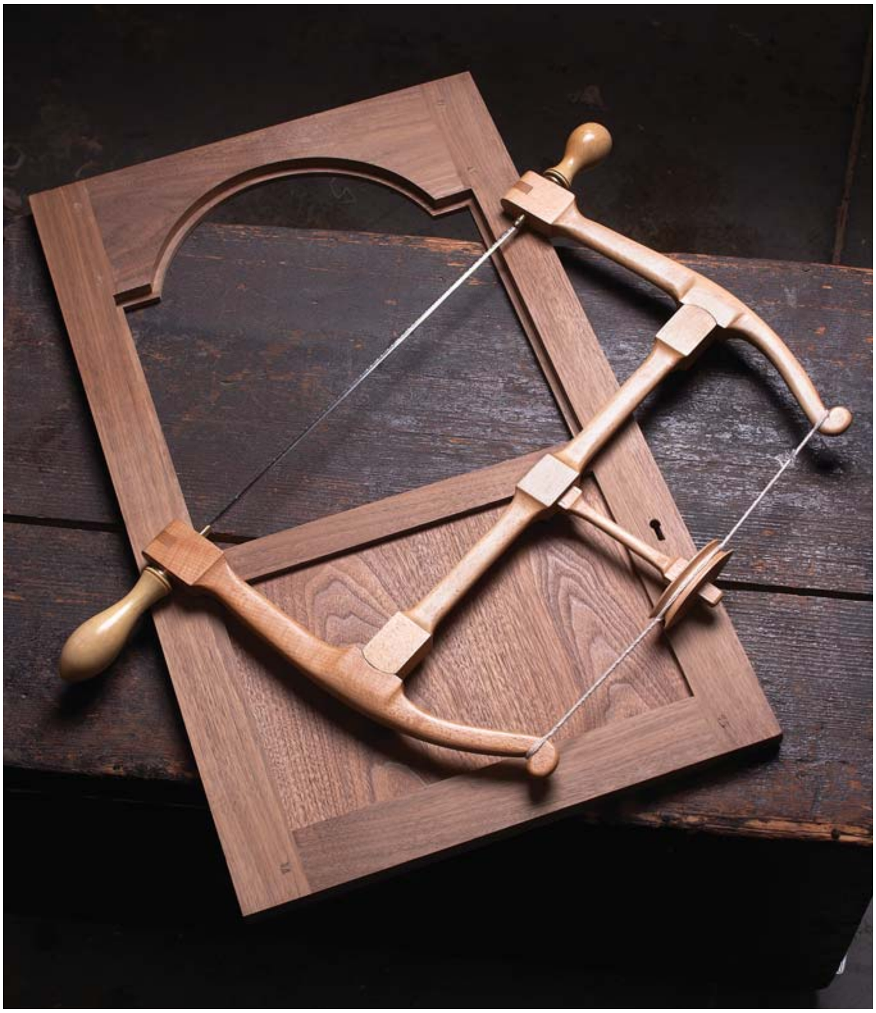
Make a Shapely Bowsaw

BY WILLARD ANDERSON

Proper, tapered handle holes make this piece period-correct.



Curvaceous. *This bowsaw, a reproduction of a mid-19th-century example with exuberantly curved arms, features traditional tapered pins – unlike modern commercial bowsaws.*

The bowsaw is an ancient tool and a member of a class of saws called frame saws, in which tension from the frame is designed to hold the blade taut. Also sometimes called a "turning saw," the bowsaw features a very narrow and thin blade with handles that turn in the frame – that makes it particularly useful for cutting curves and fretwork. Because the blade is attached by means of loose pins that are inserted in holes at each end of the blade, it is easy for a blade to be removed from the frame and slipped through a pilot hole in the stock, then remounted on the frame for cutting.

Bowsaws range in size from 6" (about the size of a modern coping saw, which is also a frame saw) to about 15" in overall length. The bowsaw contrasts with other frame saws, such as veneer and felloe saws, which feature wider blades fixed in the center of the frame and are typically used for ripping or cutting stock lengthwise.

I spied the antique bowsaw shown in the top right photo on the facing page at a tool sale, judged it too expensive to purchase, then asked the owner to lend it to me so that I could make a reproduction. He generously gave his consent. Here's irony: The cost of reproducing this bowsaw exceeded the original's price. However, what I got for my extra money was an invaluable lesson in the design and construction of the form.

> *"Men admire the man who can organize their wishes and thoughts in stone and wood and steel and brass."*
>
> — Ralph Waldo Emerson (1803 - 1882)
> American philosopher and essayist

About the Saw

The history of the bowsaw I used as a model is interesting. Although the maker of this saw is unknown, we do know that the boxwood handles were made by James Howarth, a toolmaker in Sheffield, England, who worked between 1835 and 1863. The handles were made in the earlier years of the James Howarth firm, based on the stamp details. But if the handles were sold separately, then it is hard to say when the complete bowsaw was actually made.

The feature of this saw that appealed to me most was the delicate windlass used to tension the blade. The toggle of the windlass is neatly tenoned into the stretcher's mortise, and is tenoned through a mortise in the whorl. One of the saw's arms is shaped very gracefully and was likely the original construction, because the brass blade hardware is fitted into a tapered hole in the arm

LEAD PHOTO BY AL PARRISH; STEP PHOTOS BY THE AUTHOR; ILLUSTRATIONS BY LINDA WATTS FROM THE AUTHOR'S DRAWINGS

to match the taper of the brass pin. The other arm is a replacement, less well-shaped but precise in its joinery. The maker of this arm just drilled a straight hole for the handle. The saw frame shows evidence of the shaping process in various drill, rasp, carving gouge and saw marks.

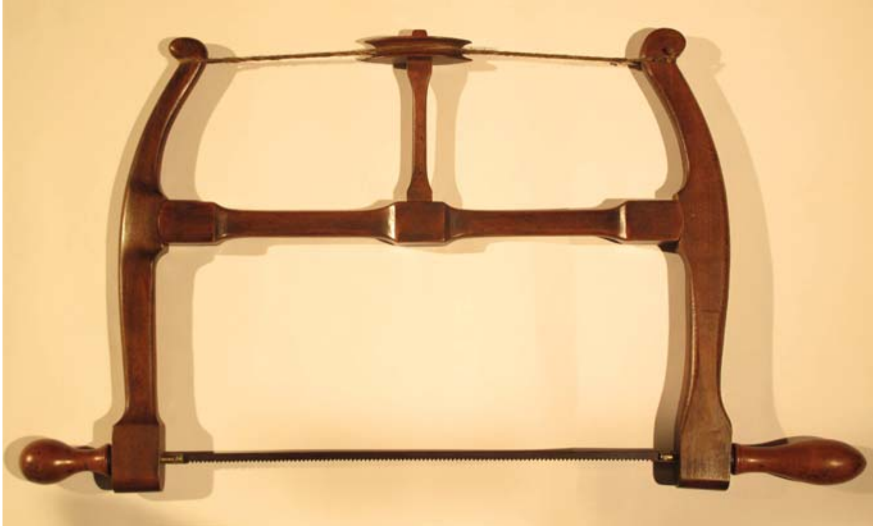
The shoulders for the mortise-and-tenon joinery for the arm and stretcher were radiused to a 2¼" circle and the tenon corners were relieved. The joinery keeps the shoulders tight as the handles seat more deeply with wear, or where there is variation in blade length. The mortise for the original arm was drilled with a 5⁄16" bit in three steps, then it was squared. The mortise in the replacement arm was just chopped out.

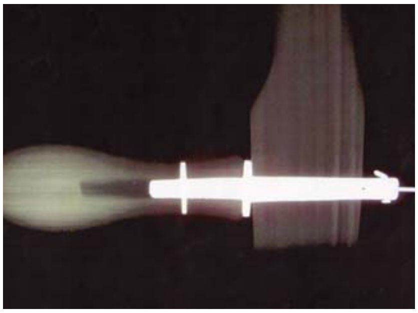
The rectangular mortise in the whorl appears to have been cut with a mortising machine in two steps, halfway from either side of the whorl, based on the appearance of rub marks on the inside of the mortise. Because this mortise may have been cut on a machine as opposed to by hand, it is possible that the maker purchased this part of the bowsaw from a vendor who specialized in this type of work. The groove for the cord in the whorl appears to have been cut to depth with a crosscut saw, a conclusion based on saw marks in the bottom of the groove.

The brass pin holding the saw blade is tapered through the original arm. A local veterinarian friend of mine kindly took an X-ray of the handle area, which verified that the brass hardware was tapered into the handle as well. The holes in the handles were drilled very deep – much longer than the pins required. There are grooves on the pin inside the handle, indicating that the pin was probably glued in place initially. Later, a steel cross pin was inserted through the minor diameter of the handle to lock the handle in place on the brass pin.

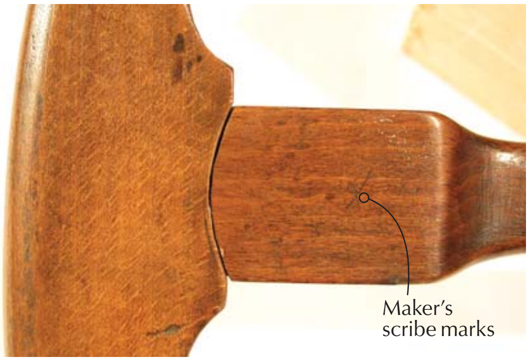
All of the modern bowsaws I've looked at have straight handle pins, and all of the antique bowsaws I've looked at have tapered pins. Tapering the pins through the bowsaw arms locks the handles in place by the wedging action of the taper, as well as by the tension from the windlass. This is an excellent mechanical method to ensure that the saw does not rotate about the handles during use, which may happen once a straight hole is worn slightly.

I do not know if the blade is original to the saw or not. It does not appear to be a band saw blade. The 15" blade is 9 points per inch (8 teeth per inch), filed to a rip cut with the blade oriented to cut on the push stroke. The rake is on average about 17°, which seems high for a ripsaw. The included angle is around 70° or more, indicating that as the


A special find. *This bowsaw, which was probably made in the mid-1800s, was discovered at a Mid-West Tool Collectors Association meeting.*


X-ray view. *This X-ray of the long handle of the bowsaw reveals the depth of the hardware hole in the handle and the taper of the brass pin at each end.*

Add tension. *This picture shows the detail of the windlass, which is used to apply tension to the bowsaw blade.*



Period marks. *Note the crossed scribe marks on the stretcher made by the original maker and used to lay out the arc of the tenon shoulder.*

user refiled the blade, he focused the file on the leading edge of each tooth, which would explain why the rake was so high. The teeth have a heavy set: 6 thousandths on each side.

For the following reasons, this bowsaw was probably made by a user. First, manufacturers often stamped their work but this saw has no stamp on the body. Second, the curvature of the arms is exuberant. In commercial bowsaws, the handle, the mortise shoulders and the finial are usually in a line, which allows all of the joinery and the holes to be cut from straight and square stock. This particular bowsaw had to be partially shaped in order to get access to the joinery surfaces for drilling the holes and cutting the mortise. And third, the degree of shaping of the bowsaw arms and stretcher is quite refined and required a lot of handwork – which would likely not have been economical in production.

Gather Your Materials

I generally cut my blades from band saw blades but you can find 15" 9 ppi pinless blades (note that these are only 14 1/2" hole to hole) at traditionalwoodworker.com.

I bought this project's Turkish boxwood as a log from Tropical Exotic Hardwoods. The quartersawn European steamed beech was purchased by special order through a local dealer.

You'll also need two taper reamers. I recommend the Brown and Sharp No. 2 taper (1/2" per foot).

The tapered brass hardware for the handles is copied from the Howarth design and machined to my specifications. It's available at edwardsmountainwoodworks.com.

I made extensive photographs, drawings and measurements of the original saw and of the brass pins in particular. I then made templates for laying out the arms and the stretcher. The schematics of these are on the facing page.

Cut your pieces to the dimensions on the cut list at right (these are the dimensions that the stock needs to be prior to shaping).

Handles

Any tight, straight-grained wood would be suitable for handles, but boxwood is often used. I cut my boxwood log to length and cut the handle blanks from the log just shy of the pith. Drill one end of the blanks to 9/32" (the small diameter of the brass pins).

Pin hole. *Drill a 9/32" hole in one end of each handle blank.*

Ream. *Before turning each handle to its final dimensions, use a hand reamer to ream the holes so that the brass pin is just shy of fully seating.*

While the blanks are in the rough, ream the holes using a hand reamer until the pins are just shy of seating completely. Turn the handles to their final dimensions. The handles are then carefully reamed for the final snug fit of the pin. Coat the pins with hide glue and tap them into place. Because the hole in the small handle is so much shorter than in the long handle, two reamers will be needed, one cut to length for the small handle.

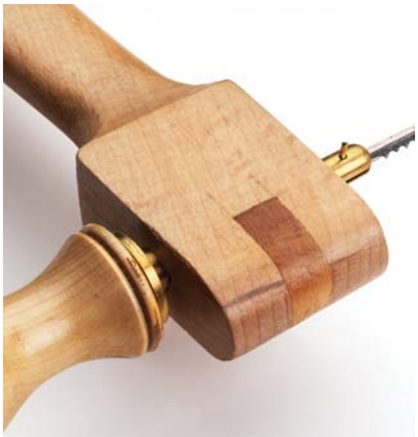
Arms

On most bowsaws, the inside face of the arm at the handle hole, the mortise and the finial are all in a line. This makes it easy to lay out and cut the holes and joinery on square stock, then to shape the arm afterward.

But on this bowsaw, the curvature of the arm is so exuberant that the finial is well in front of the mortise. Therefore, the arm needs to be partially shaped before the joinery is done. I used perfectly quartersawn beech for the frame but many other options are possible.

The weakest part of the arm is at the finial, so orient the template to give the longest grain in this region. Saw two parallel cuts to define the front and back of the arms as much as possible. Plane and spokeshave these two surfaces flat and square.

I inserted a 3/8"-thick spline into a 3/4"-deep slot into the end of each arm, at right angles to the face of the arm. The



Spline. *While the tool I was copying didn't have this spline, I added it to reinforce the tapered hole for the handle.*

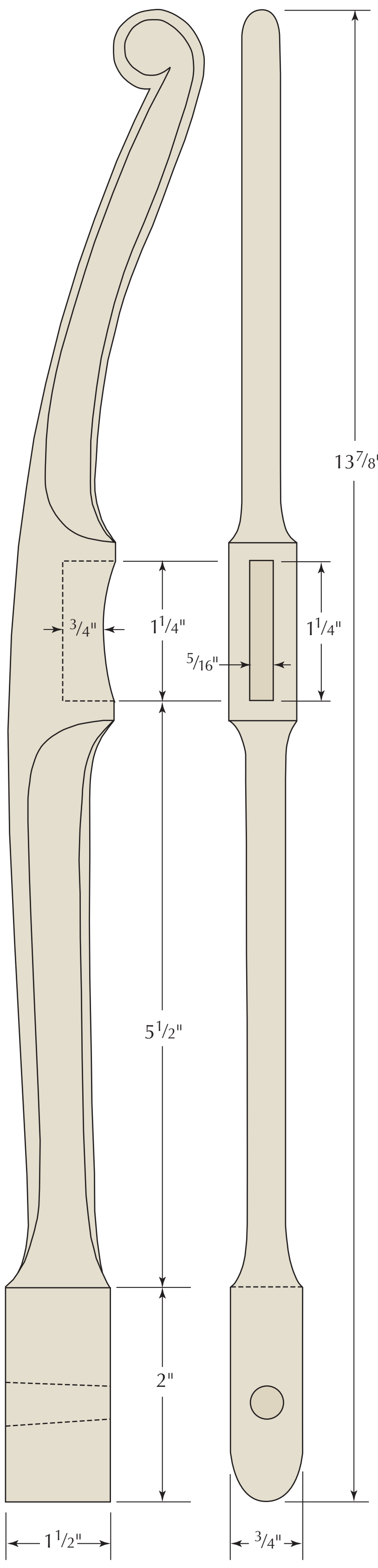
Bowsaw

	NO.	ITEM	DIMENSIONS (INCHES) T	W	L	MATERIAL	COMMENTS
☐	2	Arms	3/4	5	14	Beech*	Quartersawn
☐	1	Stretcher	3/4	1 1/4	16 3/4	Beech*	Quartersawn
☐	1	Toggle	3/8	3/4	5 3/4	Beech*	Quartersawn
☐	1	Whorl	5/8	1 1/4	3 3/8	Beech*	Quartersawn
☐	2	Handles	1 1/2	1 1/2	4-6	Boxwood**	

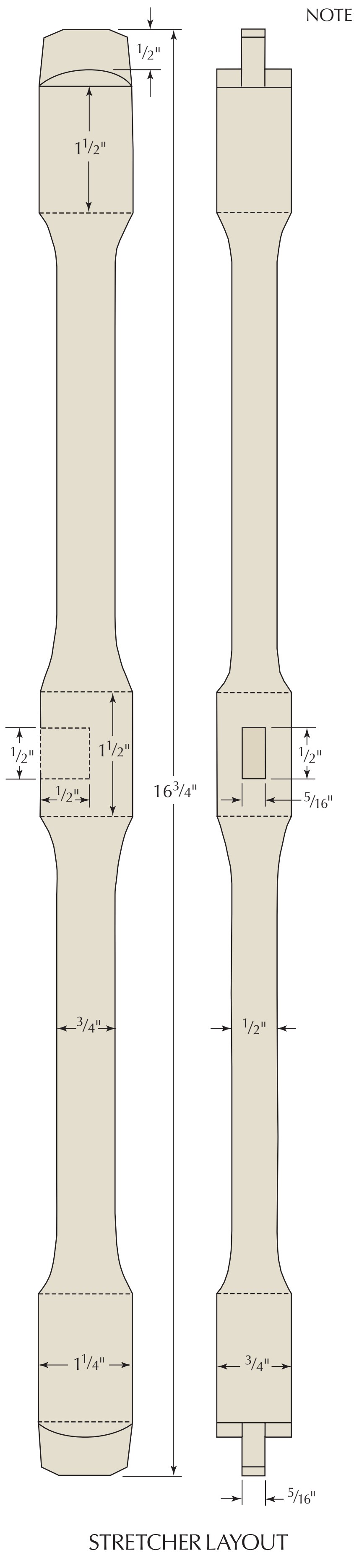
* Or hickory, ash, maple or other straight-grained hardwood

** Or ebony, dogwood or other hardwood

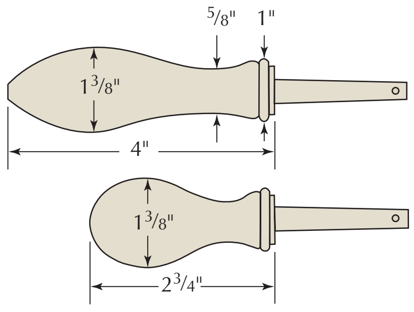
NOTE: These illustrations are not drawn to relative scale.



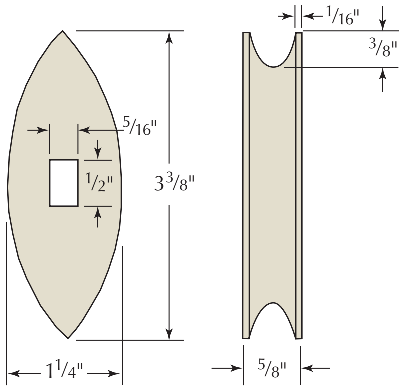
ARM LAYOUT



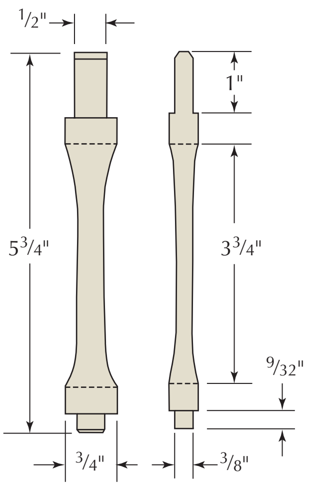
STRETCHER LAYOUT



HANDLE LAYOUTS



WHORL LAYOUT



TOGGLE LAYOUT

original bowsaw does not have such a spline, but I have often seen these on other examples of the tool. The spline ends just below the handle hole and functions to prevent the handle from splitting under the force of the taper from the pins.

The handle hole is drilled from both faces of the arm to ensure that it is square to the handle. Scribe the midline from both cheeks, then scribe a line 1" up from the bottom. Clamp the stock in a vise flush with the bench surface, and drill the hole with a 9⁄32" bit, using a square to help keep the drill vertical.

When reaming for the handle, the goal is to seat the handle so that it is locked in by the taper and not by abutting the arm. This is a trial-and-error process until the gap between the arm and the handle is ⅛" to ¼". If you taper too far, you can take a few shavings from the outside face of the arm until the handle seats properly. You will correct for this when you make the stretcher.

The mortise is as wide as the stretcher (1¼"), with shoulders only on the cheeks. Eventually the mortise cheeks are cut to an arc, but for now they are left straight. The dimensions of the mortise are 5⁄16" wide and ¾" deep. I chopped this with a sash mortise chisel.

Shape the Arm

The arm is shaped from three perspectives: the face profile (laid out with the template), the long edge view (to lay out a narrow waist between the handle and the mortise, and a taper up to the finial) and, finally, by rounding the outside edges to half-circle profiles.

The first shaping can be done either by cutting along the layout line with a coping saw or a bowsaw, or alternatively cutting to the profile line with a series of closely spaced crosscuts, then chopping out the waste with a chisel. I used both methods and they took me exactly the same amount of time. In either case, rasp the blanks to the final profile. At this point, draw a centerline completely around the arm stock, then lay out the waist and the taper profiles symmetrically.

Shape the waist profile first, then cut the tapers. The taper is not straight, but rather fat near the mortise, then curving to about ⅜" thick at the finial. Clamp the arm almost horizontally in a vise, and support in underneath with a block to hold the finial up a bit.

Shape the curve with a spokeshave. The transitions from curved surfaces to flat surfaces (at the mortise and the handle hole) should be crisp and square to the profile and meet at the corners of each edge. Define these shoulders with careful rasp and shallow gouge work.

The last shaping step is to round over the long edges of the arms. On the inside long edges, taper the rounding down from the finial and along the waist of the lower arm to end at points at the shoulders. Use a spokeshave to round the profile through the shoulders along the whole length of the arm along the outside edges of the arms. The effect will be for the shoulder arrises to curve up and down from the mortise area in gentle arcs. At the finial, carve the rounding to give a pleasing neck at the bottom of the whorl.

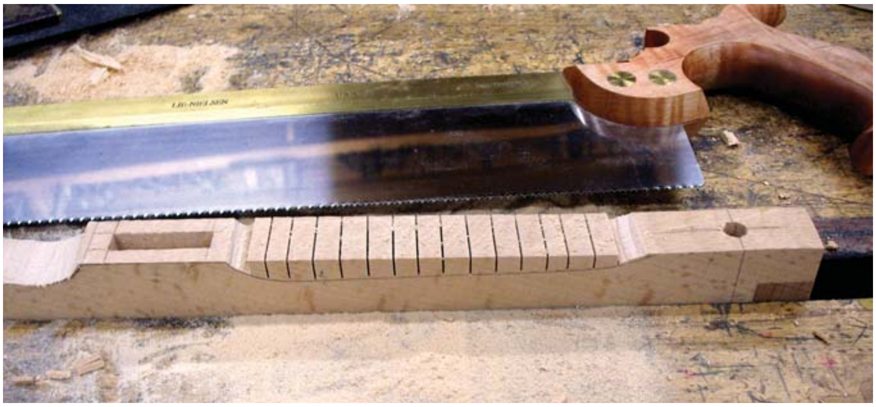
Size the Stretcher

The stretcher length is dependent on the length of the blade to be used (hole to hole), plus how far the handle pins extend through the arms. Both of these will depend on how the blade was made and how the arms were shaped and reamed. To get an accurate measurement, assemble the handles in the arms and insert the blades into the brass pins. Measure the distance from the inside face of each arm. This will be the length of the stretcher measured from the bottom of the arc of the two tenon shoulders. In addition, allow for the height of the arc (approximately ¼"), plus the length of the tenons (approximately ½"). This accounts for an additional 1½" of stock length.

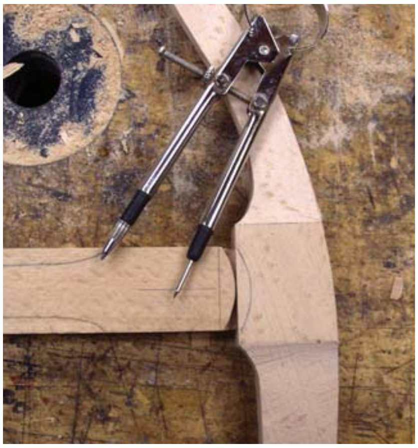
Cut the Tenons

The mortise-and-tenon joints where the stretcher meets the arms are meant to rotate to account for slight variations in the effective blade length at the handles, as the handles wear in and seat over time. The tenon shoulders are curved with an arc (a 2¼" diameter) over the full width of the stretcher material and this arc matches the arc cut on the mortise cheeks.

The tenons are tapered and rounded at the ends to give play in the joint. The cheek faces of the mortise and the tenon should be snug, however. I cut a template to match the width of the stretcher stock (1¼") and shaped inside and outside arcs at both ends. I used this template to



Shape the arms. *You can cut the shape with a coping saw or bowsaw, or make a series of crosscuts and chop the waste with a chisel.*



Play. *The ends of the stretcher are rounded to allow a little play in the joint. You can lay out the curve from the template or set a pair of dividers or compass to scribe the curve.*

lay out the arcs on the tenon shoulders and on the mortise cheeks so they would match. An alternative method (one that the original maker used) is to define the arc on the stretcher using a divider set to the radius of the circle. The maker found the midpoint on the stretcher by scribing a curve from each corner of the tenon shoulder, then used this midpoint to scribe the arc across the width of the stretcher. Lay out the tenons as 5/16" thick and 1/2" long at either end. Lay out a second tenon shoulder at 3/4". Cut the tenons to the first shoulder. Lay out the arc using the template or dividers set to the second shoulder. Chop the curved shoulder profile with vertical cuts using a bench chisel. Taper the two long edges of the tenons and knock off the corners of the ends of the tenons.

Cut the Toggle Mortise

The mortise is centered on the long edge of the top of the stretcher. This mortise is meant only to catch the toggle of the windlass. The mortise measures 5/16" by 1/2" and is approximately 1/2" deep. Note that the tenon on the toggle is only 9/32" long.

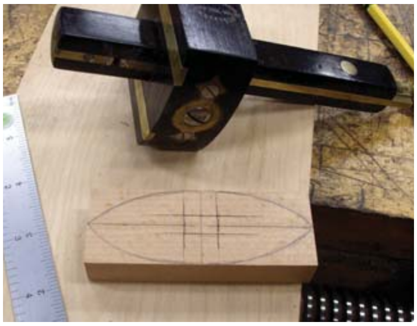
Shape the Stretcher

The stretcher is shaped in much the same way as the arms. There is a straight, flat area at each end of the stretcher approximately 2" in length where the tenons begin, and an area of about 1 1/2" in the center for the mortise. Each of these elements is defined by crisp shoulders. The area between these elements is shaped in two dimensions to give it a waist. I cut these waist profiles using both the coping saw and the crosscut methods, rough shaping with rasps and defining the shoulders with gouges.

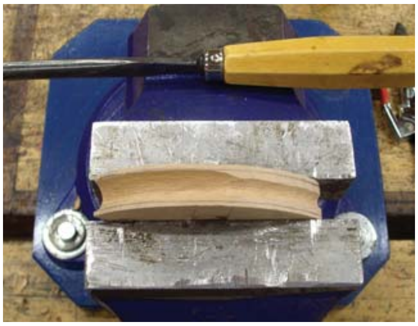
Make the Windlass

The windlass has two parts: the toggle and the whorl.

The string whorl has a central through-mortise. Lay out the whorl on square stock. Draw centerlines and carry these around on both faces. Center the mortise on these centerlines using a mortise gauge and one long and one short reference edge of the stock. In this manner, you can chop the 1/2" long, 5/16"-wide mortise accurately from both faces using a bench chisel.



Whorl. *To lay out and cut the mortise on the whorl, start with square stock and draw centerlines on both faces, then use a gauge to define the mortise on both faces, and chop in from both sides with your chisel.*



Groove. *To cut the groove on the whorl that holds the string in place, use an 11-sweep 10 mm gouge to define the depth, then switch to an 8-sweep 11 mm gouge to shape the curve up the groove's sides.*

Once the mortise is cut, lay out fair curves using the centerlines as a reference. The whorl is cut to shape with a coping saw, then rasped smooth.

To cut the groove, first lay out 1/16"-wide marks on all edges. Clamp the whorl in a vise and use an 11-sweep 10 mm gutter gouge to define the depth of the slot, then shape the curve up to the edges with an 8-sweep 10 mm gouge. Refine the groove with a round rasp and sandpaper.

The toggle is designed so that the shoulder-to-shoulder length between tenons is just a bit longer than the distance between the top of the stretcher and the bottom of the whorl when the toggle is in place. So, the tension of the string pushes the two toggle tenons snugly into their respective mortises. The tenon through the whorl is fairly snug and protrudes through the whorl. The tenon into the stretcher is relatively loose (approximately 1/32" shy in both dimensions).

Lay out the toggle tenons with a mortise gauge, then cut them with a bench chisel (because so little material has to be removed). Shape the waist, starting approximately 3/8" from each tenon shoulder. Because the cuts are so shallow, use a rasp for this step.

The Finishing Steps

The period bowsaw I copied for this build appears to have been stained – although this could be patina from age. I decided to sand my bowsaw parts up to #220 grit. I then applied three coats of shellac, and followed that by buffing with #0000 steel wool, then topped it with a final coat of wax.

The final task is to string the saw. I used a heavy cotton twine, but jute would work, too. I tied one end with a loop, then wound the string around the finials three full times. On the fourth course, I cut the string off halfway around then wove the end through the three strings on one side.

Now insert the toggle and whorl between the two groups of three strands and turn the windlass until the blade is tight. The blade should have a sharp pitch when plucked, but not be overtight (this is a matter of feel and, ultimately, of performance).

When the saw is not in use, release the windlass a turn or two so that the tension is off the blade but the saw pieces remain together. **PWM**

Bill works and teaches woodworking classes in his workshop at the base of Edwards Mountain in Chapel Hill, N. C.

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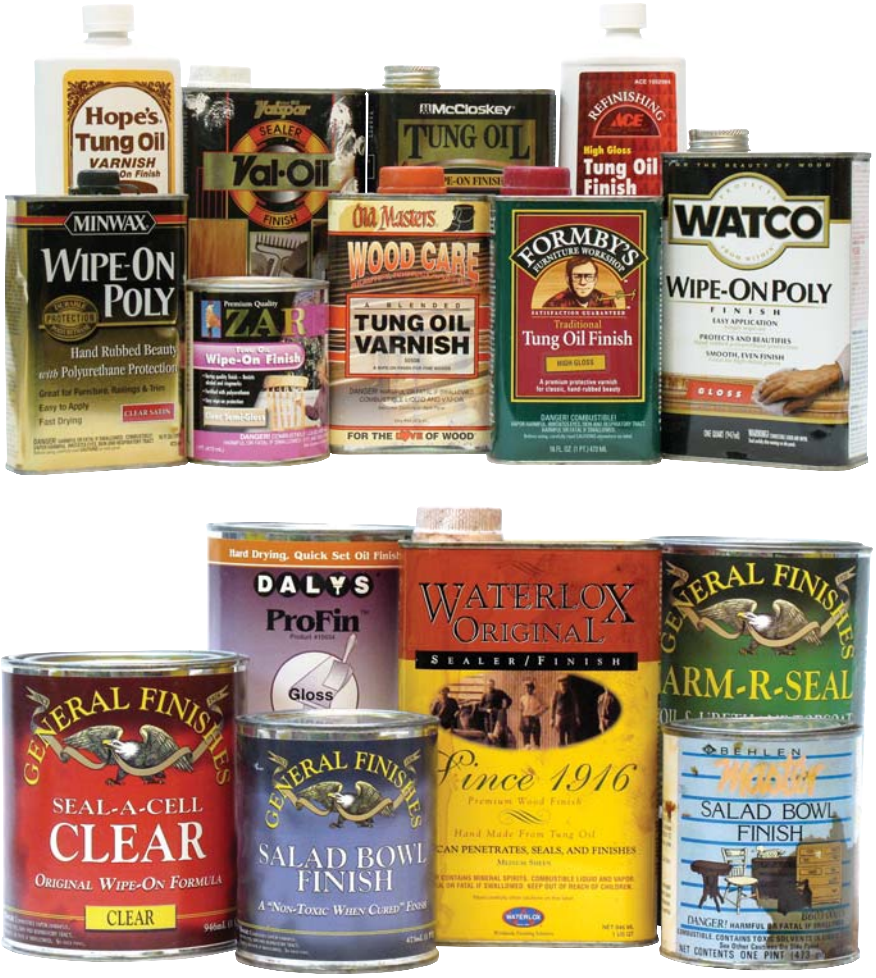
Wiping Varnish

BY BOB FLEXNER

An excellent finish for first timers (and beyond).


Hope's Tung Oil Varnish
Valspar Sealer Val-Oil
McCloskey Tung Oil
ACE Refinishing Tung Oil Finish
Minwax Wipe-On Poly
ZAR Wipe-On Finish
Old Masters Wood Care Tung Oil Varnish
Formby's Tung Oil Finish
Watco Wipe-On Poly
Daly's ProFin
Waterlox Original Sealer/Finish
General Finishes Arm-R-Seal
General Finishes Seal-A-Cell Clear
General Finishes Salad Bowl Finish
Behlen Salad Bowl Finish

Commercial wiping varnishes. *(Top) These are typical commercial brands of wiping varnish sold in home centers and paint stores. (Bottom) These are typical commercial brands of wiping varnish sold in woodworking stores and through catalogs.*

Wiping varnish is the finish I recommend you use if you are finishing for the first time. Wiping varnish is a term I coined in 1990 to categorize a large number of very popular finishes that are sold individually under many different names but are actually all the same – oil-based alkyd or polyurethane varnish thinned about half with mineral spirits (paint thinner). Collecting them into a category removes the mystique manufacturers attempt to create and it makes the finish easier to understand. It also allows us to discuss uniform application procedures that apply to all brands.

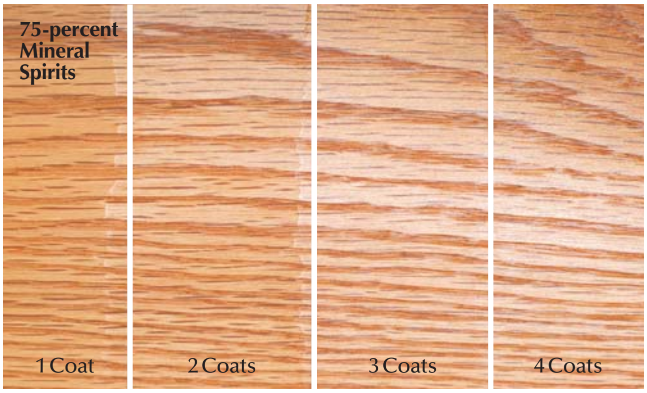
Identifying wiping varnish. *Because of the uninformative naming, you need a method for identifying commercial wiping varnishes. Unfortunately, you can rarely do this from the label. You will need to put a puddle of the finish on the lid or other non-porous surface and see how it cures. If the product thins and cleans up with mineral spirits and isn't labeled "varnish" or "polyurethane," and it cures hard and smooth after several days in a warm room, it's wiping varnish.*

Notice from the pictures above that many of the brands of wiping varnish are labeled "tung oil," "tung oil varnish" or "tung oil finish." None of these are tung oil and few have any tung oil in them. Even in the rare cases when a little tung oil is added, it is insignificant and doesn't justify the misleading naming. All of these products are simply oil-based alkyd or polyurethane varnish thinned about half with mineral spirits. (The wiping varnish Waterlox is a phenolic varnish.)

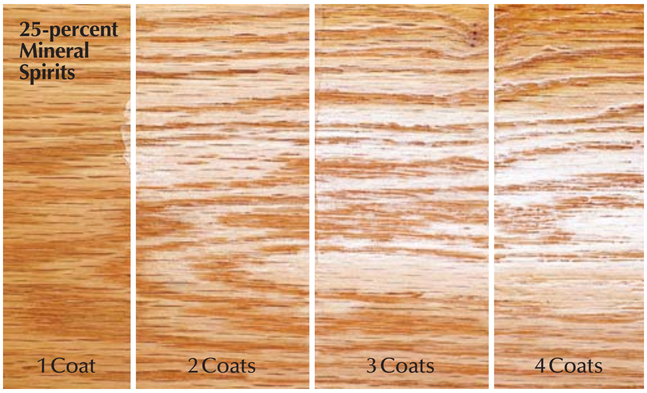
The difference between varnish and oil finishes is that varnish dries hard and can be built up on the wood for better moisture resistance. Oil (boiled linseed oil, 100-percent tung oil and blends of oil and varnish) dries soft so all the excess must be wiped off after each coat. No built-up moisture resistance can be achieved. This is a big difference!

You can distinguish wiping varnish labeled "tung oil" from real tung oil by the following: Real tung oil is always labeled "100-percent tung oil," so far as I know; no brands of real tung oil contain thinner (mineral spirits – usually called

PHOTOS BY THE AUTHOR



Thin mix. *A thin mix of polyurethane and mineral spirits (paint thinner) builds very slowly.*



Thick mix. *A thick mix of polyurethane and mineral spirits builds much more rapidly and is still thin enough for easy application.*

“petroleum distillates” or “aliphatic hydrocarbons” on the label); wiping varnish always contains thinner.

For this exercise on scrap wood you should make your own wiping varnish. You could use a commercial brand, but making your own gives you more control because you can add more or less thinner. You have much more control of the rate of build per coat if you make your own wiping varnish than if you buy a commercial brand. In the picture above left, panel sections are finished with one, two, three and four coats of polyurethane thinned with 75-percent mineral spirits – that is, a one-part polyurethane to three parts thinner.

In the picture above right, the panel sections are finished with one, two, three and four coats of polyurethane thinned with 25-percent mineral spirits – that is, three parts polyurethane to one part thinner. In both cases, the finish was brushed and left. You can clearly see the faster build using the three-to-one mix. Though I’m going to use a half-and-half blend (similar to commercial brands) for this exercise, I recommend you try the three-to-one mix because it is still thin enough to be easy to apply, and it builds faster. You can always add more mineral spirits if the finish is tacking up too quickly.

Make Your Own

Instead of buying a poorly labeled wiping varnish and taking the risk that you get something else – for example, an oil/varnish blend – just make your own. All you have to do is thin any full-strength, oil-based varnish or polyurethane a quarter-to-a-half with mineral spirits.

Make your own. *To make your own wiping varnish for this exercise/project, pour approximately equal amounts of oil-based, gloss polyurethane and mineral spirits into a clean wide-mouth container.*

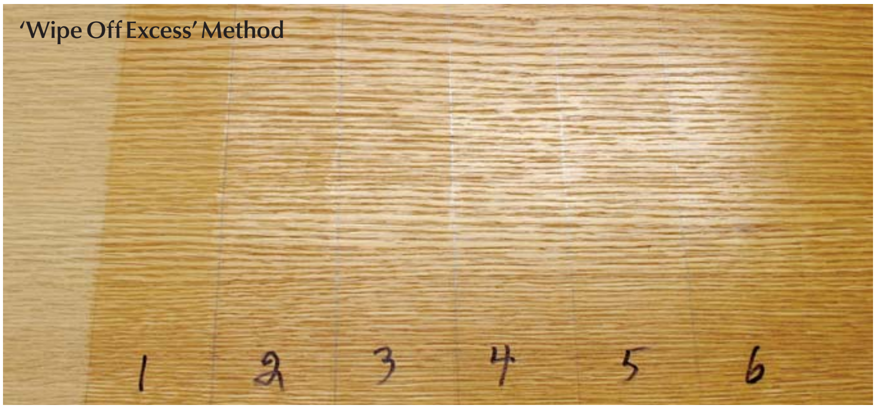
Be sure to stir. *Stir the thinned polyurethane or the two parts will remain separated.*

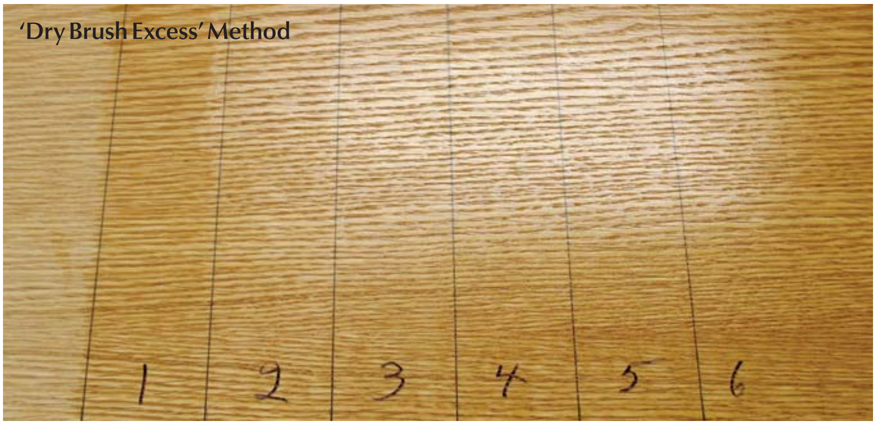
What You Need for Applying Wiping Varnish

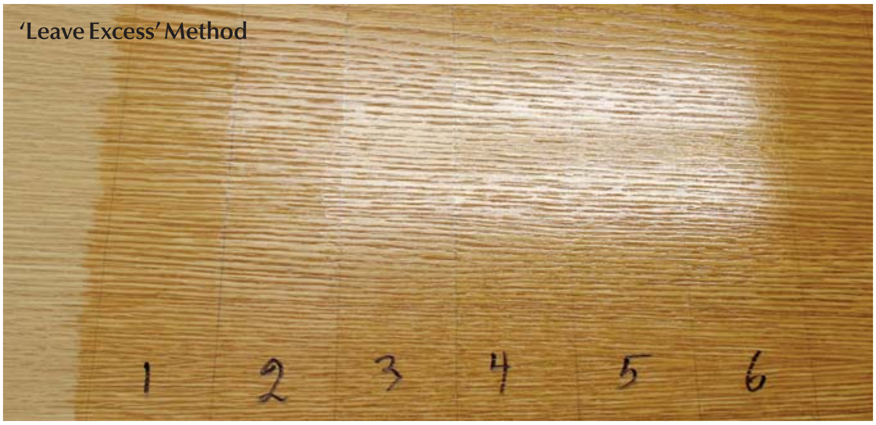
- A 16" x 24" or larger sheet of ½" or ¾" veneered plywood or MDF. Any hardwood veneer is OK. You can get this from your scraps, a wood supplier or from one of many cabinet shops (which often throw away pieces this size).

The following items are all available from a home center, paint store or woodworking store or catalog/web site.

- A pint or quart of gloss, oil-based polyurethane varnish.
- A pint or quart of mineral spirits.
- A clean plastic container, coffee can or wide-mouth jar with a lid. (Also likely available in your kitchen.)
- Latex or other type of protective gloves.
- Lint-free rags such as old, clean T-shirts, cheesecloth or paper rags (soft white paper towels in a box or roll marketed to painters).
- A good quality natural-bristle brush (best), or foam brush, or an inexpensive “chip” brush. A width of 2" is easy to use on most projects.
- A sheet of #320- or #400-grit sandpaper.
- A small brown paper bag (from the supermarket).







Applying Wiping Varnish

I'm going to show you three methods of applying wiping varnish: wipe off the excess; "dry-brush" the excess; and leave the excess. You can use any of the methods for all the coats or alternate among them. I suggest you try both of the first two methods to see which you like best. You can use the third method on flat, horizontal surfaces.

At left are pictures of one through six coats using each application method. In the upper picture I applied from one to six coats and wiped off the excess after each. In the middle picture I applied from one to six coats and dry-brushed the excess after each. In the lower picture I applied from one to six coats and left them to dry. You can see that wiping off produces the slowest build and leaving produces the fastest build.

> *"Applying finishes is easy and logical … [but] don't be impatient."*
>
> — Bob Flexner
> from 'Wood Finishing 101'

'Wipe Off Excess' Method

Brush or wipe the wiping varnish onto the wood and wipe off the excess. This method produces the best results, meaning that there are no runs, no possibility of brush marks and almost no dust nibs. But the build is very slow, so it takes more coats than the other two methods to get the same look and protection against moisture.

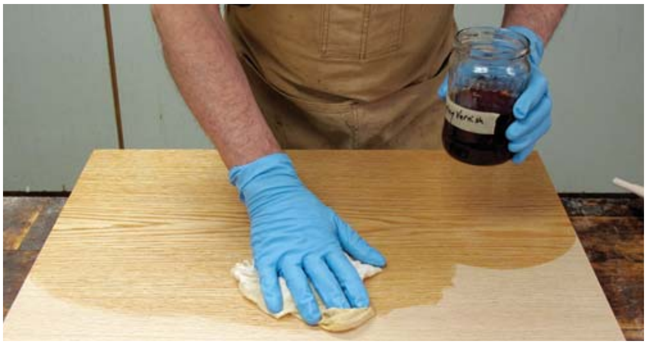
1 ***'Wipe off excess' method.*** *If you choose to brush the finish, the fast, efficient method on flat, horizontal surfaces is to deposit a brush load of the wiping varnish onto the near edge then spread it. Here, I'm using an inexpensive, throwaway bristle brush, called a "chip" brush, because I'm not worried about bristles falling out. They will be removed when I wipe off the excess finish.*

2 ***Spread the finish.*** *With a puddle of wiping varnish deposited, spread it end to end. You can use an inexpensive, throwaway, foam brush instead of a bristle brush.*

First Coat. The first coat soaks into the wood and seals it when the finish dries. So, even though you intend to wipe off the excess, you should apply a wet coat to all areas and keep it wet for several minutes. Add more finish to areas that become dull due to the finish soaking in. You can use this wipe-off method of applying wiping varnish to "shine up" other finishes that have become dull (be sure the surface is clean) or to make a brushed varnish or polyurethane finish almost perfect after you have sanded out the brush marks.

Sand Smooth. The surface always feels rough after the first coat. A critical step for achieving a smooth final result is to sand this coat smooth after it dries.

More Coats. Keep applying coats (with six hours to overnight between each) until you're happy with the look of the finish. The procedure for each additional coat is the same. First, you sand and clean the surface as just described. Then you brush or wipe on the wiping varnish and wipe off the excess before the finish dries.



3 ***Wipe on wiping varnish.*** *The most efficient way to apply wiping varnish when you intend to wipe off all the excess is simply to wipe it on. Wet your rag well with the finish, or pour some finish onto the wood and spread it around with the rag. You want to put on a wet coat so the wiping varnish penetrates well.*

4 ***Wipe off wiping varnish.*** *With the surface well wetted, wipe off all the excess with a dry cloth. (You could also use a durable paper towel.) There's no need to scrub the surface. A little dampness won't hurt anything.*

5 ***Sand first coat.*** *After drying, sand the surface lightly using #320- or #400-grit sandpaper until the finish feels smooth. It shouldn't take much, usually not more than one or two passes everywhere. There's no reason to use a flat block to back the sandpaper. Abrading with sandpaper produces much better results than using steel wool or abrasive pads because sandpaper cuts off while the others merely round over.*

6 ***Feel for dust.*** *After removing the dust with a vacuum, tack rag or dust brush, wipe over the surface with your hand. You'll feel if there is any remaining dust and, as long as it's not much, you'll remove it with your hand. You can clean off your hand by wiping it on your pants leg.*

7 ***Apply more coats.*** *Wipe a damp-to-wet coat of wiping varnish over the entire surface you're finishing. You don't need to make these coats as wet as the first one because the finish can no longer soak into the wood.*

8 ***Wipe off after each.*** *Wipe off the excess finish. You can leave the surface a little damp.*

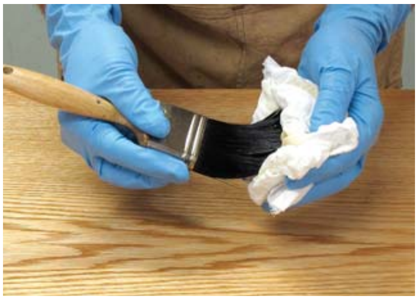
'Dry Brush Excess' Method

Brush wet coats of wiping varnish onto the wood and remove some of the finish with a dry brush. This method leaves more build than wiping off the excess, but still eliminates the possibility of runs and sags.

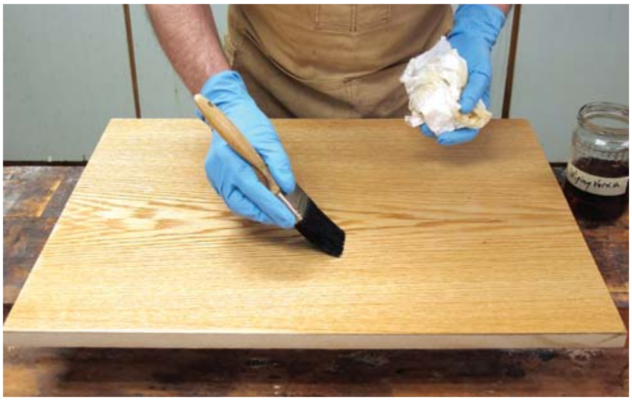
First Coat. Brush a wet coat of wiping varnish over the surface as in the wiping-off method. You could also wipe on a wet coat with a cloth.

Sand Smooth. It's always critical to sand after the first coat so the roughness doesn't telegraph through each additional coat.

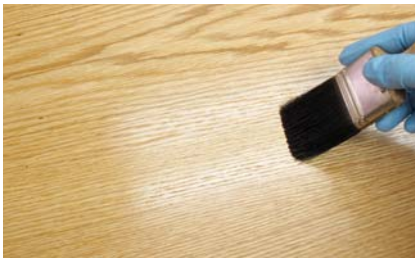
More Coats. All additional coats go on the same as the first. Apply as many as you need to get the look you want, allowing overnight drying for each in a warm room. Be sure to sand each coat smooth before applying each additional coat.



1 ***'Dry brush excess' method.*** *With the surface wet with wiping varnish, dry your brush on a clean cloth.*



2 ***Brush off excess.*** *Then brush back over to pick up some of the finish. At the beginning, dry the brush after each pass so you pick up the maximum amount of finish. If you decide to go over the surface a second time, you can make several passes before wiping. It's best to use a better-quality bristle brush that won't shed bristles.*



3 ***Reflected light.*** *Watch what's happening in a reflected light. Your goal is to get an even thickness of finish without puddles on horizontal surfaces or runs on vertical surfaces.*

4 ***Sand smooth.*** *After it's dry, sand the surface with #320- or #400-grit sandpaper. You can use just your hand to back the sandpaper. Make two or three passes everywhere until the finish feels smooth.*

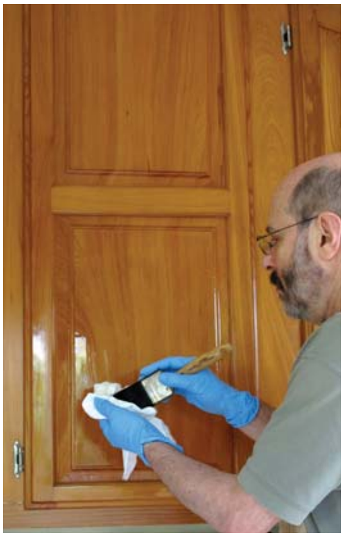
There should be very little dust. You may be able to remove it with just your hand, wiping it on your pants leg. But you can use a vacuum, dust brush or a tack rag, then wipe with your hand to check that all the dust has been removed.

5 ***More coats.*** *Brush a wet coat of wiping varnish onto the surface. You don't have to be too careful how you brush because the dry brushing will smooth things out.*

6 ***Dry brush excess.*** *With the entire surface wet, begin lifting some of the wiping varnish by brushing over with a dry brush.*

7 ***Dry the brush.*** *After each pass, dry your brush on a clean cloth. If you decide to dry-brush the surface a second time, you can make more than one pass before drying the brush. You'll get the feel very quickly.*

8 ***Vertical surfaces.*** *The dry-brushing method is perfect for vertical surfaces. You can also wipe off all the excess, of course, but dry brushing leaves a thicker build with each coat without runs or sags. Always watch what is happening in a reflected light (overhead, window or light on a stand) and dry brush to remove any problems you find.*



'Leave Excess' Method

Brush wet coats of wiping varnish onto the wood and leave them, allowing overnight drying between each. This can be done only on flat horizontal surfaces such as tabletops because of runs and sags. You can always use the dry-brushing technique to remove excess on edges and other connected vertical surfaces to avoid runs.

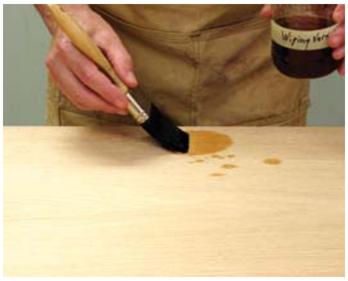
First Coat. This is a brush-on-and-leave method of applying wiping varnish. So it's just like brushing full-strength varnish or polyurethane, or brushing paint.

Sand Smooth. The first coat of finish always causes a rough surface. You need to sand this smooth before continuing to the next coat.

More Coats. Brushing and leaving builds the finish much more quickly than wiping off or dry brushing. But dust nibs are more likely because the finish remains tacky longer. Be sure to sand lightly between each coat. You're finished when you achieve the look you want.

Finish Up. There are always some dust nibs stuck in the last coat of finish. As long as they are small and there aren't too many of them, you can remove them by rubbing the surface with a brown paper bag. **PWM**

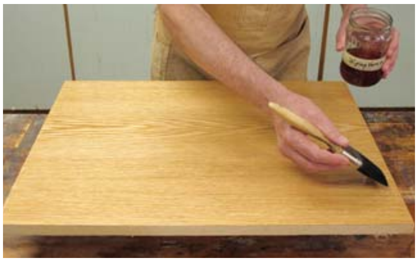
This article is excerpted from Bob's book, "Wood Finishing 101," He's also the author of "Flexner on Finishing" (both Popular Woodworking Books).



1 ***'Leave excess' method.*** *Deposit a brush load of wiping varnish onto the near edge of the panel. A "brush load" is the bristles dipped about one-third to one-half way into the wiping varnish, lifted out and plopped down on the wood.*

2 ***Stretching out.*** *Stretch the wiping varnish out edge to edge. You don't have to be as careful with wiping varnish as you do with full-strength varnish or polyurethane because wiping varnish levels well. You could even brush across the grain and the finish would still level so you don't see the brush marks.*

3 ***Continue as if painting.*** *Continue depositing the wiping varnish and stretching it out across the surface.*



4 ***Airplane landings.*** *So as not to drag the bristles over the edge and cause runs down the side, use airplane-like landings about an inch or so in from each edge and brush across and off the other side.*

5 ***More coats.*** *After drying, sand the surface lightly using #320- or #400-grit sandpaper until the finish feels smooth (right). It shouldn't take much, usually not more than one or two passes everywhere. There's no reason to use a flat block to back the sandpaper. (Again, abrading with sandpaper produces much better results than does steel wool or abrasive pads.)*

Remove the sanding dust with a tack rag, vacuum or dust brush. A tack rag (far right) or vacuum is best because brushing kicks dust into the air; the dust can then settle back onto a freshly applied finish and stick to it.

Just before applying the next coat, wipe over the surface with your hand. You'll remove any remaining dust. Continue with more coats until you are happy with the appearance.

6 ***Smoothing trick.*** *A brown paper bag works exceptionally well at removing the roughness caused by fine dust nibs stuck to the last coat. Simply fold the bag and rub the surface. To avoid scratches, it's best to allow the finish to dry to the point that you don't smell anything when you put your nose against the surface and take a whiff.*

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Bloxygen	57	3	bloxygen.com
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Franklin International	18, 19	14	titebond.com
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Grizzly Industrial	Cvr 2, 1	57	grizzly.com
JET	5	72	jettools.com
Jim Bode Tools	57	24	jimbodetools.com
John Campbell Folk School	57	25	folkschool.org
Keller & Company	56	26	kellerdovetail.com
Lake Erie Toolworks	56	70	lakeerietoolworks.com
Lee Valley	Cvr 4	28	leevalley.com
Leigh Industries	11	–	leighjigs.com
Lie-Nielsen Toolworks	63	29	lie-nielsen.com
Lumbersmith	13	62	lumbersmith.com
Newton Woods	57	33	walnutwoods.net
Oneida Air Systems	61	35	oneida-air.com
Packard Woodworks	56	37	packardwoodworks.com
Philadelphia Furniture Workshop	56	–	philadelphiafurnitureworkshop.com
Powermatic	2	58	powermatic.com
RadarCarve	13	38	radarcarve.net
Rockler	13	75	rockler.com
Royalwood Ltd.	57	42	royalwoodltd.com
School at Annapolis Woodworks	57	43	annapoliswoodworks.com
Shopbot	61	44	shopbot.com
Steel City Tool Works	7	61	steelcitytoolworks.net
Tools for Working Wood	23	45	toolsforworkingwood.com
Wagner Electronics	22	65	wagnermeters.com
Wall Lumber	23	47	walllumber.com
Whitechapel Ltd.	56	48	whitechapel-ltd.com
Woodcraft	17, 22	49	woodcraft.com
Woodfinder	56	–	woodfinder.com
Woodline	11, 59	50	woodline.com
Wood-Mizer	56	51	woodmizer.com
Woodworker's Hardware	22	73	wwhardware.com
Woodworker's Source	56	53	woodworkerssource.com
Woodworker's Supply	13	54	woodworker.com

I CAN DO THAT

BY MEGAN FITZPATRICK

Tool Tote

Wedged through-tenons keep this handle secure.

A handy tote. *No matter what you decide to put in it, a tote is always useful.*

Whether you're using it for woodworking tools or garden tools, a tote is a simple and quick project. It's so simple, in fact, that I decided to add a wee degree of difficulty with a curved handle secured in place by wedged through-tenons. And, I wrapped the handle with suede for a more comfortable and secure grip.

A Quick Trip to the Lumber Aisle

Like all our I Can Do That projects, this tote is made from dimensional S4S lumber, available at any home center. I chose pine for this project because a) it's inexpensive, b) the poplar looked like beavers had gnawed it to size, and c) red oak is too heavy – especially after you load the tote with tools.

You need to buy only two pieces of wood: a 6'-long 1x8 and a 2'-long 1x4. While it's always best to pick through the rack for the straightest, best-looking lumber you can find, in the case of this 1x4, it's particularly important because it will be hard to fit the through-tenons if the handle stock isn't straight.

An Exercise in Chamfering

First, set up a stop-block at the miter saw to cut the two side pieces to 22" in length. Then move the stop-block and cut the two 13"-long ends. Cut the handle stock to 22¼" in length.

Now, pick the show face of your sides and use your block plane to chamfer each edge – first knock off the four corners to avoid spelching. This is a tool tote – not a piece of furniture – so it's a good opportunity to practice "freehand" chamfering. Hold your block plane at a consistent angle and keep making passes until you like the way the chamfer looks. If you simply must have perfect chamfers (and don't trust your freehand skills), mark a line ⅛" back from the corner around the edges, and again around the face, then plane down to your layout lines on both.

Next, lay out the through-mortises and curves on your two end pieces. First, strike a centerline. The ¾" x 1½" mortise is centered side to side, and starts 1¼" down from the top edge. Mark it on both sides of the workpiece.

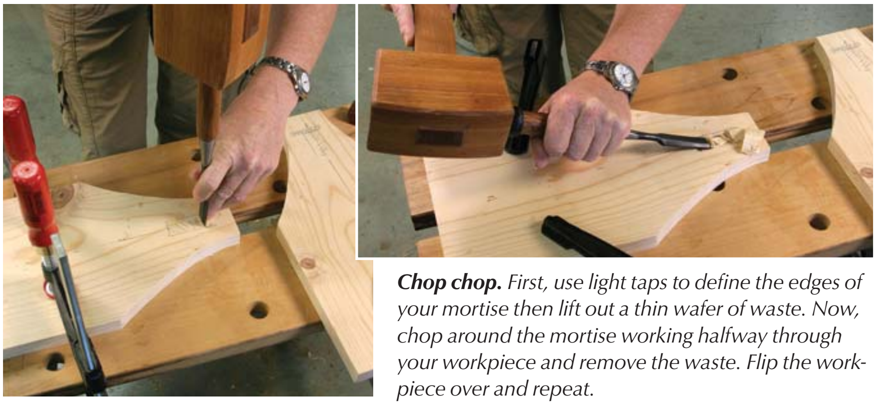
The top point of the curve on my sides starts at a point 1" to either side of the centerline, and terminates flush where the side pieces will join the end pieces (so that's 7¼" from the bottom). Join the two points with a curve that looks good to your eye (I used a 5-gallon bucket as a template).

With the layout complete, cut the curves with a jigsaw and use a rasp to refine the shape as needed before sanding smooth.

Through-mortises

Clamp the workpiece flat on your Workmate and lightly define the edges of your mortise with a chisel, then lift out the shallow chip of waste (the beveled side of the chisel should always face the waste area). Now chop halfway through the

CONTINUED ON PAGE 60



Chop chop. *First, use light taps to define the edges of your mortise then lift out a thin wafer of waste. Now, chop around the mortise working halfway through your workpiece and remove the waste. Flip the workpiece over and repeat.*

LEAD PHOTO BY AL PARRISH; STEP PHOTOS BY THE AUTHOR; ILLUSTRATION BY ROBERT W. LANG

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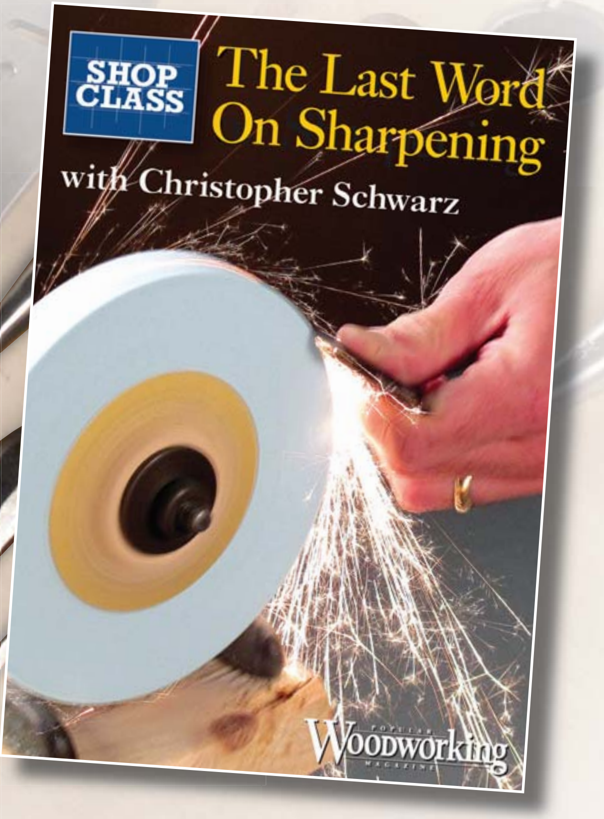

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CONTINUED FROM PAGE 58

workpiece, remove the waste, then flip and repeat until your mortise meets in the middle. Do the same on end two.

When working with 3/4" pine and on such a small mortise, I see no benefit to drilling out the majority of the waste. Pine is easy to chop – I can be done in the time it takes me to find the proper-size bit and drill a series of holes.

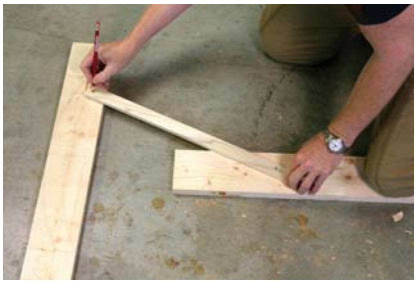
Get a Handle on It

My handle is 1 1/2" in width along the entire length and the straight area at both ends is 3 1/8" long. But before you lay out your handle, measure your mortises and adjust the handle width to fit.

The curved portion is an arc of a 16"-diameter circle – too big for my compass. So, I made a down-and-dirty trammel to mark the curve (see the photo above).

You know what comes next: Cut out the handle using your jigsaw, then use a rasp and sandpaper to refine the shape. (Clamp a straightedge to the work to use as a sawguide for the straight cuts.)

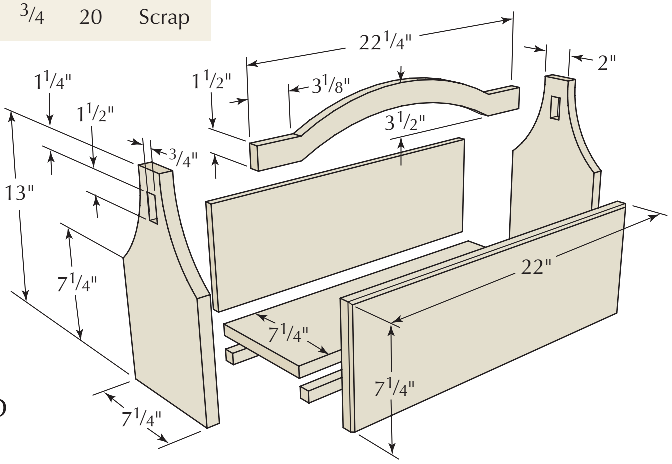
Dry-fit the ends through the mortises, using your block plane or sandpaper to adjust the tenons as needed. They should go in with light hand pressure. With the tenons fit, remove the handle and saw a 5/16"-deep kerf across each end.



Scrap trammel. *It's simple to make a trammel to lay out large curves. Drill a pencil hole at one end of a flat, straight piece of scrap. Measure the distance of the diameter of the required circle (in this case, 16"), and use a nail to secure the other end of the stick to a piece of scrap the same thickness as your workpiece. Line up the trammel on the centerline of your workpiece, then mark the curve.*

Tool Tote

	NO.	ITEM	DIMENSIONS (INCHES) T	W	L	MATERIAL
☐	2	Sides	3/4	7 1/4	22	Pine
☐	2	Ends	3/4	7 1/4	13	Pine
☐	1	Bottom	3/4	7 1/4	20 1/2	Pine
☐	1	Handle	3/4	3 1/2	22 1/4	Pine
☐	2	Cleats	3/4	3/4	20	Scrap



EXPLODED VIEW

Cut wedges from a scrap of 3/4"-thick hardwood using your handsaw.

Assemble

Glue and nail a cleat at the bottom interior edge of each side piece. Now make sure the handle ends are inserted through the mortises, line up the sides and ends so everything is flush, and clamp the box together. Drill three pilot holes at each corner, then nail the box together with 6*d* finish nails.

Paint glue on the thin end of the wedges, insert them in the kerfs at either handle end then alternate ends as you tap the wedges until they're fully seated (this will help keep the handle centered in the box). After the glue dries, cut the wedge flush with the tenon.

Wedgie. *After using a handsaw to cut a kerf in the center of each end of the handle, paint your wedges with glue and tap them in. After the glue dries, trim the wedge flush with the end of the handle.*

Cut the bottom to fit, and slip it in place (take a few passes with your block plane along one long edge as needed).

Sand to #120 grit and paint, then wrap the handle with some suede. Now your tools can travel in style. **PWM**

Megan is managing editor of this magazine.

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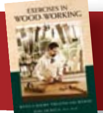

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GLOSSARY

Woodworking's lexicon can be overwhelming for beginners. The following is a list of terms used in this issue that may be unfamiliar to you.

bowsaw (n)
Sometimes called a turning saw, this ancient form is a member of the frame saw family, wherein a frame is employed to tightly hold a thin, narrow blade.

boxwood (n)
A light-colored dense wood from a slow-growing evergreen. It is sometimes used in musical instruments, chess pieces and was, at one time, the wood of choice for woodworking rules.

chamfer (n, v)
(n) An angled edge that connects two surfaces, typically the edge and face of a board. It is usually symmetrical at 45°. Chamfers are often used to create simple shadow lines, and to soften sharp edges. (v) To cut an angled edge.

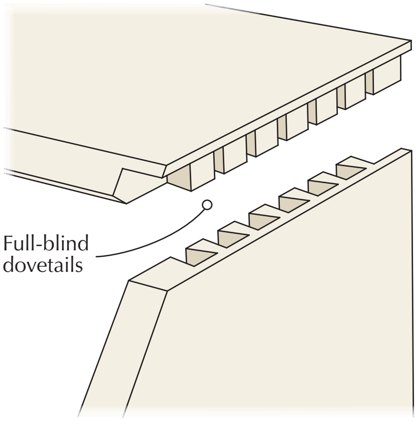
cleat (n)
A narrow strip of wood typically used to support or strengthen an adjoining surface, or to support a panel.

clip (n)
L-shaped piece of wood often used to attach a top to a table or an upper case to a lower case. The tongue fits into slots in the lower section sides; the thicker part is screwed through the bottom into the tabletop or case.

dry brush (v)
A technique used to remove excess wet finish by dragging a brush not loaded with material over the wet coat of finish. The brush is wiped after each stroke.

fair curve (n)
A curve that is as smooth and perfect as it can be along a designated path. Also, a curve that is visually appealing.

> *"Have no fear of perfection – you'll never reach it."*
>
> — Salvador Dali (1904 - 1989)
> Spanish painter



full-blind dovetails (n)
A dovetail joint in which neither the pins nor tails are seen. Visible corners of this seldom-used joint may be mitered or rabbetted.

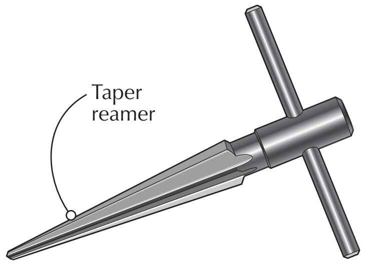
lopers (n)
Arms, or sometimes small drawers, that pull out of a case to support a drop-down lid on a desk.

phenolic (n)
The first synthetic resin (marketed under the name "Bakelite") that is made by combining phenol with any number of aldehydes. Formaldehyde is commonly used.

S4S (n)
A designation that stands for "surfaced four sides." Boards are properly milled to S4S when the two opposing faces are parallel and the edges are 90° to those faces, and parallel to one another. S4S lumber is commonly found at big box stores.

spelch (v)
To splinter or blow out the edge or corner of a workpiece when planing across the grain. Avoid this by cutting a small chamfer at the far edge of your workpiece.

taper reamer (n)
Designed for use with powered drills traditional braces, or as a hand tool, these cone-shaped cutters produce a tapered hole rather than the straight hole made with a drill bit. Reamers are most often used by chairmakers.



tote (n)
The (typically wooden) handle located at the rear of a handplane used to push the tool through the cut; the handle of a saw. Also, a handled container used to carry tools or other items.

trammel (n)
An instrument for drawing or scribing circles that are too large for a compass to handle. It typically consists of a narrow beam with two sliding points. Archimedes' trammel is a mechanism for drawing or scribing ellipses.

windlass (n)
Part of a bowsaw that works in conjunction with twine, string or catgut to tighten or loosen the saw's tension. It is made up of two parts: a whorl (a football-shaped piece with a groove along its edge) and a toggle. The toggle is mortised through the whorl.

writing surface (n)
On a slant-lid desk, this term refers to the base of the desk interior – the area where paper is laid for writing, differentiated from the back side of the lid. It is also the piece on which hinges attach the desk lid to the case. PWM

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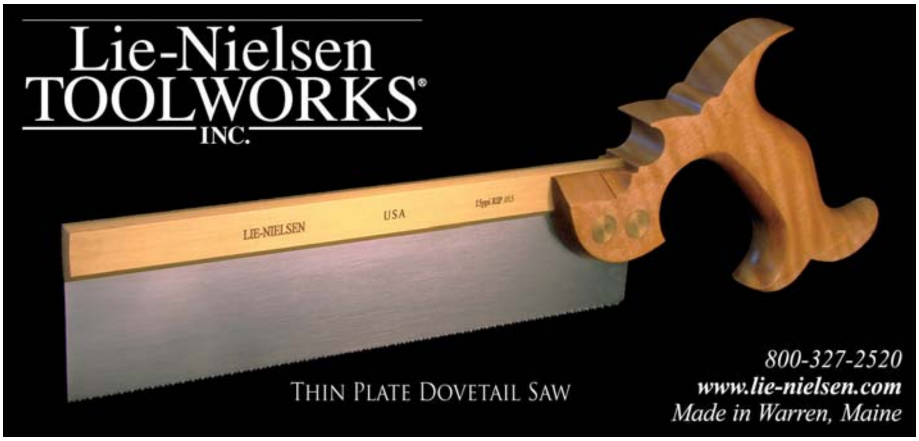

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BY ELIA BIZZARRI

The Apprentice

Persistence (and a crazy mother) can help.

I slept on a cot in the loft of the shop, cooked on a portable burner, and walked my dirty dishes through the garden to the basement sink. Curtis Buchanan walked in at seven one morning to discover white splotches on a pair of freshly painted chairs waiting to be delivered. Oatmeal-water splotches. He tried re-oiling, steel-wooling and every trick learned in his 25-year-career.

For the unfortunate reader who has never seen Curtis's black-on-red paint job: It is a stunningly beautiful finish. It's also a laborious undertaking involving five coats of paint, finger-numbing rubbing with steel wool, then several coats of oil followed by rubbing, wax and more rubbing. So when Curtis said there was nothing for it – I would have to scrape the seat down to bare wood so he could repaint it – I knew how much work that meant for him. But he didn't tell me to cook outside from now on; he never said a recriminating word.

Several years earlier Curtis had agreed to have me – a 17-year-old kid – spend a week in his Jonesborough, Tenn., Windsor chair shop. I split logs for him and he showed me a few things. I became Curtis's sole apprentice, though my position was never formalized. Ours was a relationship built on trust, not on words or papers.

Curtis is, in 18th-century terms, my Master, but I also learned from others. With the housewrights at Colonial Williamsburg, I handplaned the doors for Payton Randolph's purple storage shed. Arranged by Roy Underhill, that opportunity had its start years earlier:

"That's Roy Underhill!" shouted my mother, as we walked through Colonial Williamsburg. With her more-than-slightly embarrassed son in tow, she proceeded to explain to the ever-interrupted Roy that her 8-year-old son watches "The Woodwright's Shop" every week and loves building things. Then she asked a question no sane 20th-century mother would ask: "Where can Elia get a woodworking apprenticeship?"

Perhaps fate and mothers walk hand-in-hand. I now teach at Roy's Woodwright's School.

If there is one iconic tool of the chairmaker, it is the drawknife. In my youth, both Drew Langsner and John Alexander taught me the tool's use; I had the drawknife licked – or so I thought.

In Jonesborough, Curtis effortlessly whittled a complicated chair spindle, handed me the drawknife, and told me to make him some spindles. The firewood box claimed my first three; the rest had some slight potential. Four or five years later, I was making spindles as fine as Curtis's and I was happy.

One January I embarked on my Great Northern Tour, the ultimate goal being the Vermont home of Curtis's mentor, Dave Sawyer. Dave is an MIT graduate who builds a chair like a Ford truck – precisely by the plans. He wanted me to carve spindles. No problem, I thought. I've whittled hundreds of spindles. The first took 10 minutes and landed in the wood stove; the next claimed 15 minutes with a similar end; the third took 20 minutes only to join its charred and flaming friends. Dave said, "I carve spindles – 'whittling' sounds rough, like a Boy Scout with a pocket-knife."

Slowly, I realized that craftsmanship is not a destination, but a road to be traveled. Rather a pretty drive, but with detours, potholes and the occasional oatmeal splatter. **PWM**

Elia is a professional Windsor chairmaker who lives and works in Chatham County, N.C.

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For links to all these online extras, go to:

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WEB SITE: *Visit Elia's web site.*

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PHOTO OF THE AUTHOR AT WORK BY JEREMY M. LANGE

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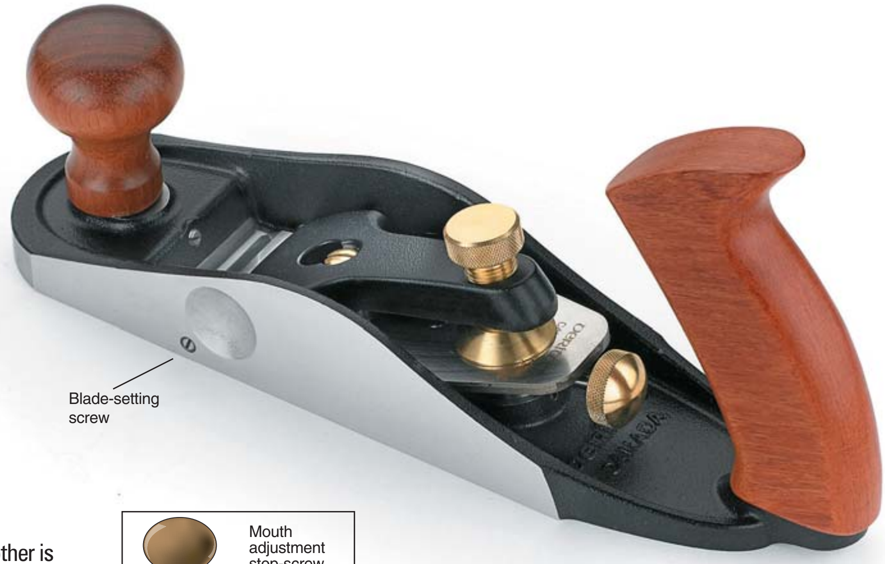
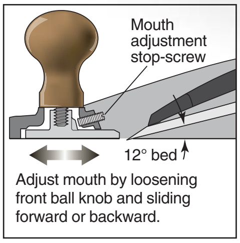
Our Latest Additions To Our Family Of Planes



Veritas® Small Bevel-Up Smooth Plane

Comparable in size to a #3 bench plane, this low-angle smoother is 9″ long, 2$\frac{5}{16}$″ wide and weighs only 2 lb 12 oz. Useful for final finishing of surfaces, end-grain work and for shooting miters, it is easier to maneuver and less fatiguing to use than a full-size smoother. The narrower (1$\frac{3}{4}$″ wide) blade makes cuts easier to push through. The machined and surface ground ductile cast iron body has a 12° bed angle and a movable toe fully enclosed by the body casting. The locking front knob controls the toe to set the mouth opening, while a stop-screw in the throat allows repeatable mouth setting and prevents contact between the blade and toe. The Norris-type adjuster mechanism combines feed and lateral adjustments for accurate and easy blade setting. Set screws on either side of the blade prevent shifting. Yielding an effective cutting angle of 37° to minimize fiber tearing, the included 25° bevel blade is $\frac{1}{8}$″ thick, lapped, and available in A2 or O1 tool steel. Bubinga front knob and rear handle. Made in Canada. Patented.

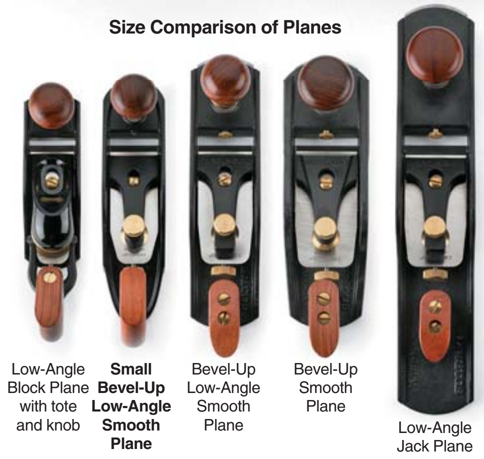
05P39.01 Small BU Smooth Plane, A2 **$179.00**
05P39.51 Small BU Smooth Plane, O1 **$179.00**



Adjust mouth by loosening front ball knob and sliding forward or backward.

Enclosed toe can be adjusted for fine shavings (minimum tear-out) or opened for heavier cuts.

Size Comparison of Planes


Low-Angle Block Plane with tote and knob
Small Bevel-Up Low-Angle Smooth Plane
Bevel-Up Low-Angle Smooth Plane
Bevel-Up Smooth Plane
Low-Angle Jack Plane

Veritas® Detail Palm Planes

With a height-adjustable palm rest for better in-hand registration, these miniature planes are easily maneuvered and permit fine, controlled cuts. The investment-cast steel body has a 45° bed angle and a fixed mouth, and uses a brass retention screw to secure the included 30° bevel A2 tool steel blade (0.06″ thick by $\frac{3}{8}$″ wide). The soles are approximately 1$\frac{1}{2}$″ long by $\frac{5}{8}$″ wide and are available in four profiles. The concave and convex planes have curved soles with a side-to-side radius of $\frac{1}{2}$″. The double-convex (spoon) version has a $\frac{1}{2}$″ side-to-side radius and a 4″ front-to-back radius. The bubinga palm rest is removable for work in tight spaces. Made in Canada. Patent pending.

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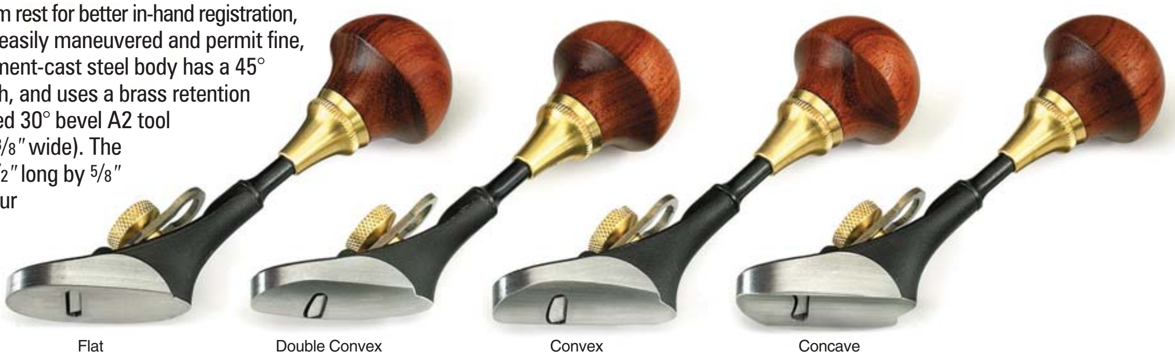
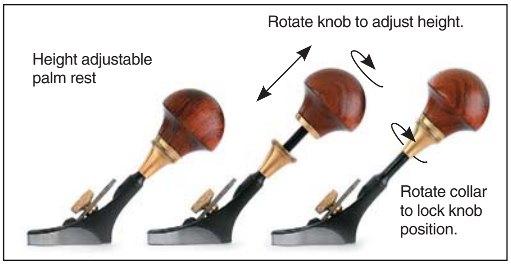
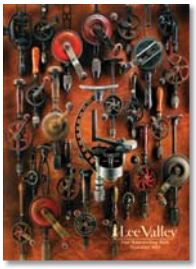



Rotate knob to adjust height.
Height adjustable palm rest
Rotate collar to lock knob position.



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